U.S. Army Corps of Engineers - Buffalo District
City Of New Orleans

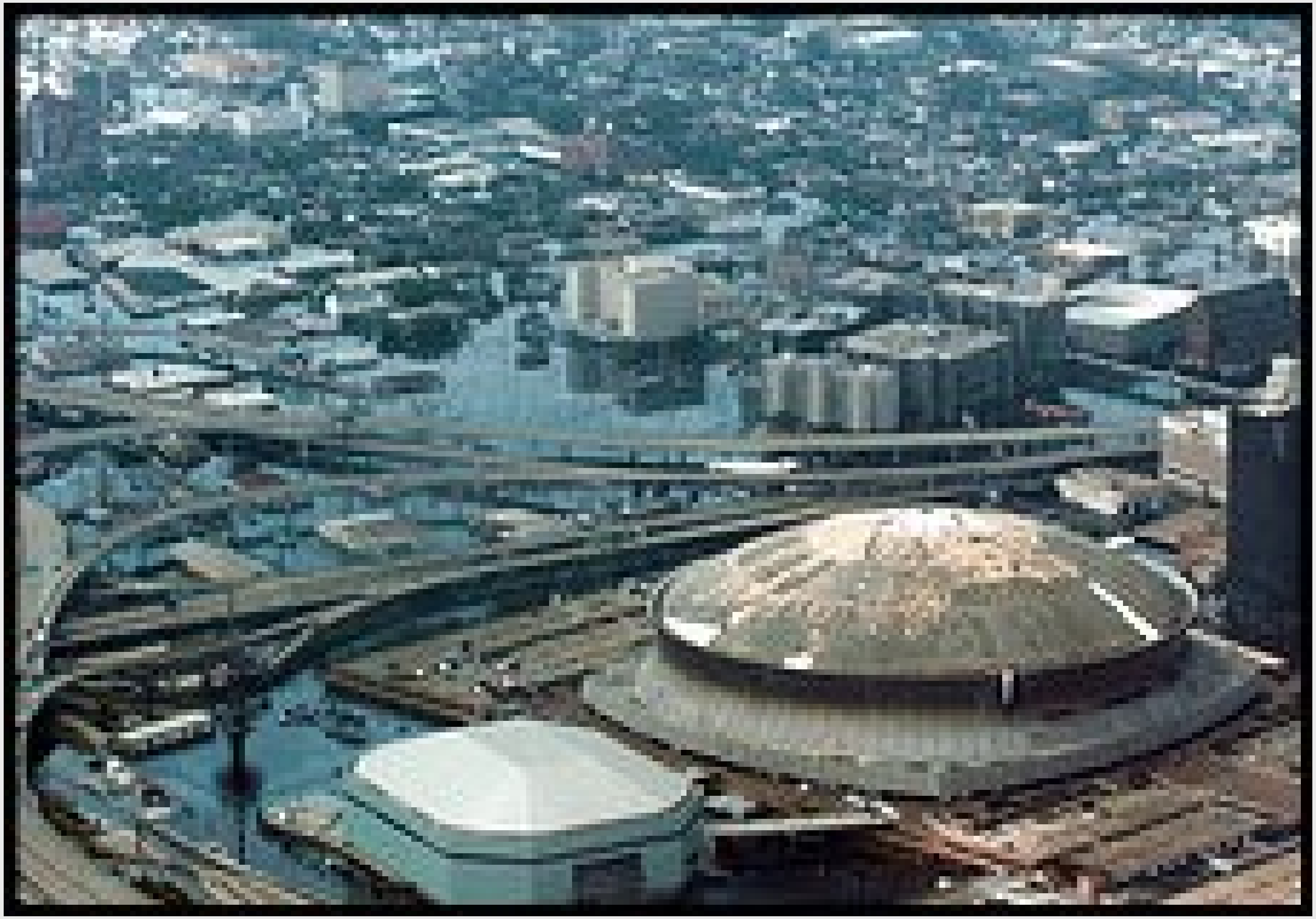
Structural Safety Assessment Inspection Training

(18 OCT. 2005)

POST DISASTER SAFETY EVALUATION of BUILDINGS (Hurricane Katrina – City of New Orleans)

Outline

1. *Introduction*
2. *SSA Program Overview*
3. *SSA Process and Procedures*
4. *Damage due to Wind and Flood Loads*
5. *Building Evaluation Procedures*
6. *Safety*
7. *Accela Software Training*



1. Introduction

Introduction

Event: *Hurricane Katrina*

Event Date: *August 29, 2005*

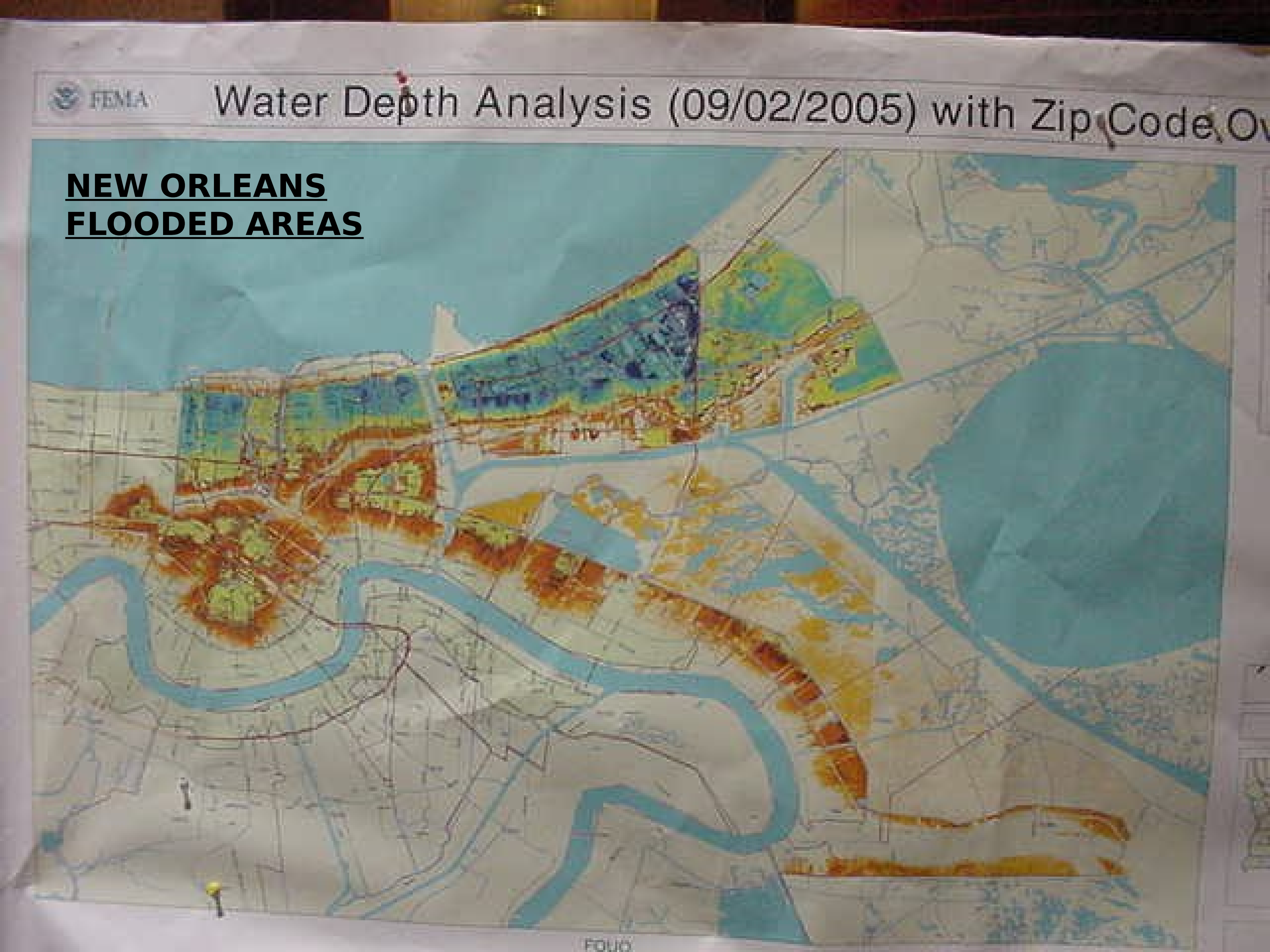
Location: *City of New Orleans, LA*

Tasker: *Structural Safety Assessments of Buildings*

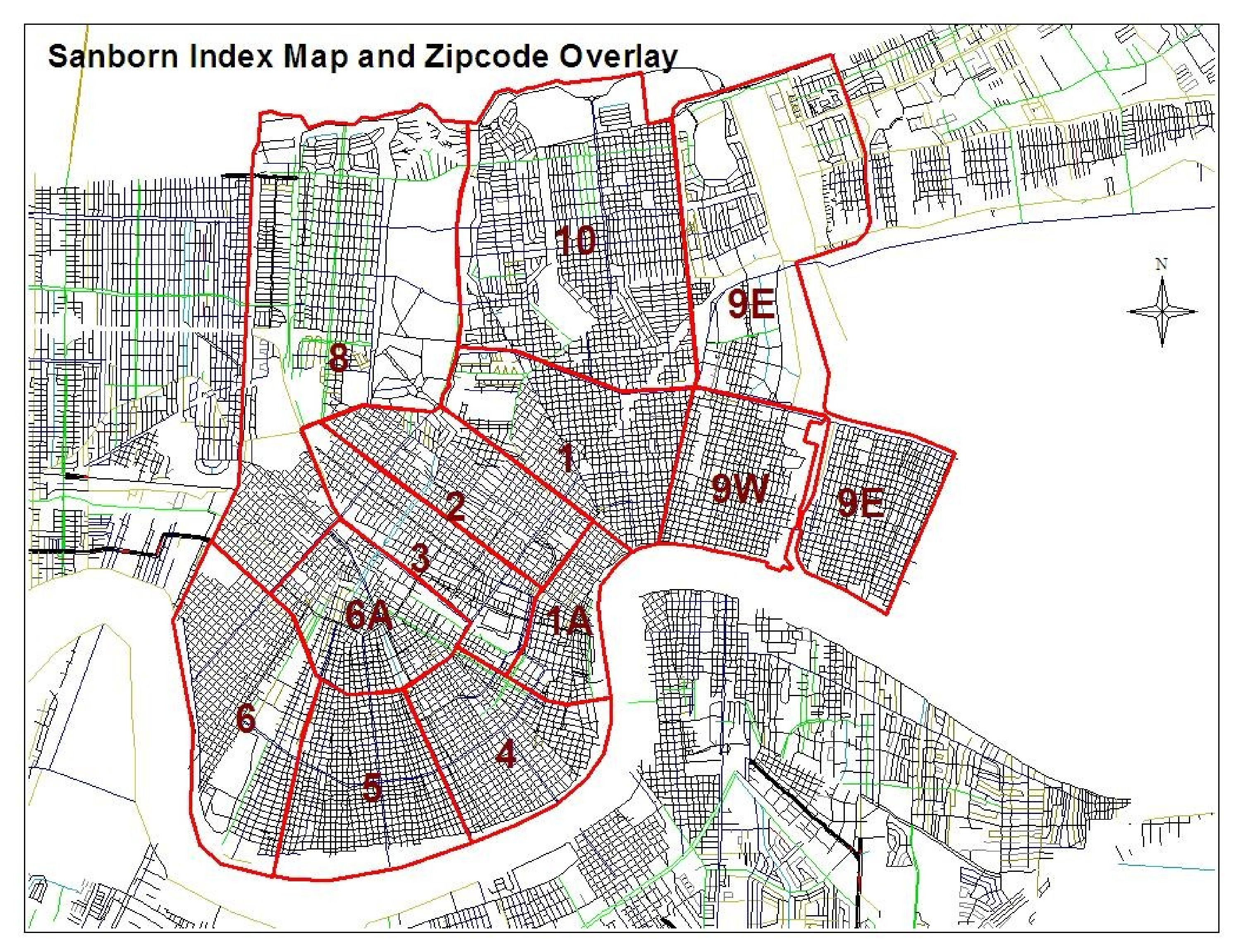
- *Training Purpose and Scope*
  - Provide guidelines and procedures for conducting post-windstorm and post-flooding structural safety assessment (SSA) inspections for buildings impacted by Hurricane Katrina within City of New Orleans
  - Specifically, to determine whether damaged buildings are safe for use, or if entry should be restricted or prohibited

- *Training Purpose and Scope (cont’d)*
  - To determine extent of damages to buildings
  - Approximately 80k – 100k structures damaged requiring inspections
  - Most structures requiring inspections will be residential homes and apartments; some light commercial

NEW ORLEANS FLOODED AREAS


FEMA
Water Depth Analysis (09/02/2005) with Zip Code Ov
FOUO

Training Purpose and Scope (cont’d)


Sanborn Index Map and Zipcode Overlay
10
9E
8
1
2
9W
9E
3
6A
1A
6
4
5
N

2. Safety Assessment Program Overview

SSA Inspection Program Goals

- **To provide housing recovery support to the City of New Orleans and its citizens**

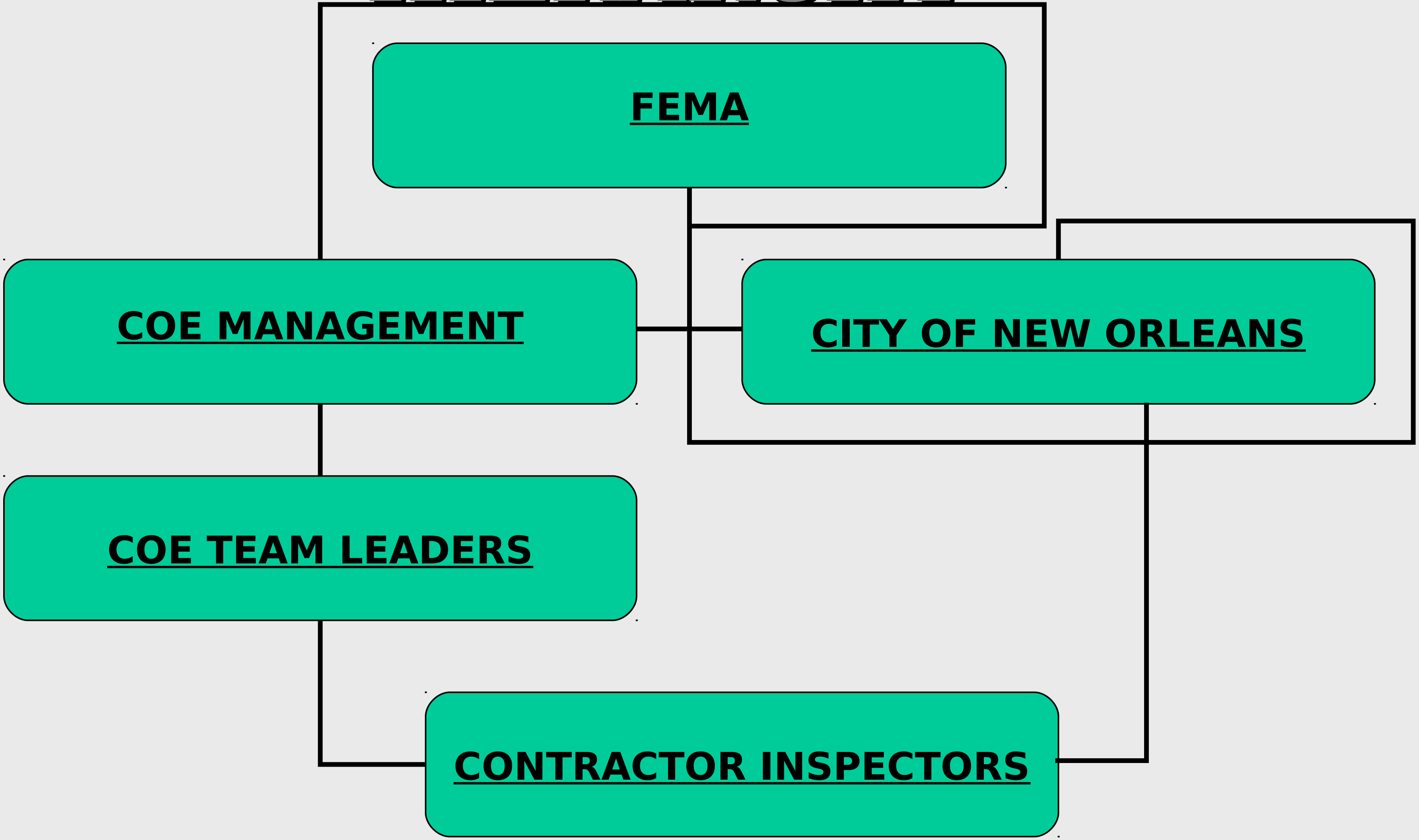
- **To get as many people as possible back into their homes as quickly and safely as possible**

- **To provide the City a quality product in a timely manner**

Required Resources (cont'd)

- City has only 15 Building Inspectors – they are overwhelmed and have to also handle permit requests from residents needing to rebuild
- Corps of Engineers providing SSA inspection technical assistance
- Outside resources needed to perform the numerous SSA inspections required

ORGANIZATIONAL HIERARCHY



FEMA

COE MANAGEMENT

CITY OF NEW ORLEANS

COE TEAM LEADERS

CONTRACTOR INSPECTORS

Inspector Qualifications

- Engineers
- Architects
- Certified Building Officials or Inspectors

- General knowledge of construction
- Professional experience & education
- Good Judgment

Who has building safety assessment responsibilities?

- City of New Orleans Department of Safety and Permits - has authority to post occupancy notices; must be signed and carry name of local jurisdiction

- Contract inspectors can post official occupancy notices **if** deputized by jurisdiction

Liability Issues

- Protection is provided for all responders:
  - Representing home jurisdiction
  - Have been deputized
  - Performing duties within scope of professional conduct

3. Safety Assessment Process and Procedures

Types of Evaluations

- *Rapid Evaluations (exterior only)*
- *Detailed Evaluations (interior & exterior)*
- *Engineering Evaluation (requires professional analysis)*

Types of Evaluations (cont'd)

- *For City of New Orleans inspections we will be doing Rapid Evaluations (Exterior only)*
- *These inspections will include assessments of interior damages as determined by judgment and "peeking" inside building*

Types of Evaluations (cont'd)

- *For this tasker, SSA inspections will only be done for residential buildings (i.e. homes, duplexes, multi-plexes, apartments, etc.)*

- *O.K. to do small commercial businesses such as corner stores, combination residence/business, corner taverns, gift shops, etc.*

Types of Evaluations (cont'd)

- *Will not be doing public structures (i.e. churches, schools, fire halls, plazas, gas stations, public housing, etc.)*

- *Also will not be doing commercial and industrial businesses*

Required Inspection Assessments

- Structural Safety Assessment - Examine building for structural damages and special hazards (Postings will be Green, Yellow, or Red)
- FEMA Damage Assessment – Estimate of percent damages to individual components of building

Structure Postings

- GREEN - INSPECTED **Habitable, safe to enter/occupy, minor or no damage**
- YELLOW – RESTRICTED USE **Damage that represents some degree of threat to occupants, entry and occupancy restricted**
- RED – UNSAFE **Not habitable, unsafe to enter/occupy, significant threat to life & safety**

*Green **INSPECTED** Posting*

- ***Definition***
  - **No structural or non-structural hazards found; building safe**
  - **Minor damages; repairs may be required**
  - **Building did not get flooded, but may have wind damage**

Green ***INSPECTED*** *Posting*

Definition (Cont’d)

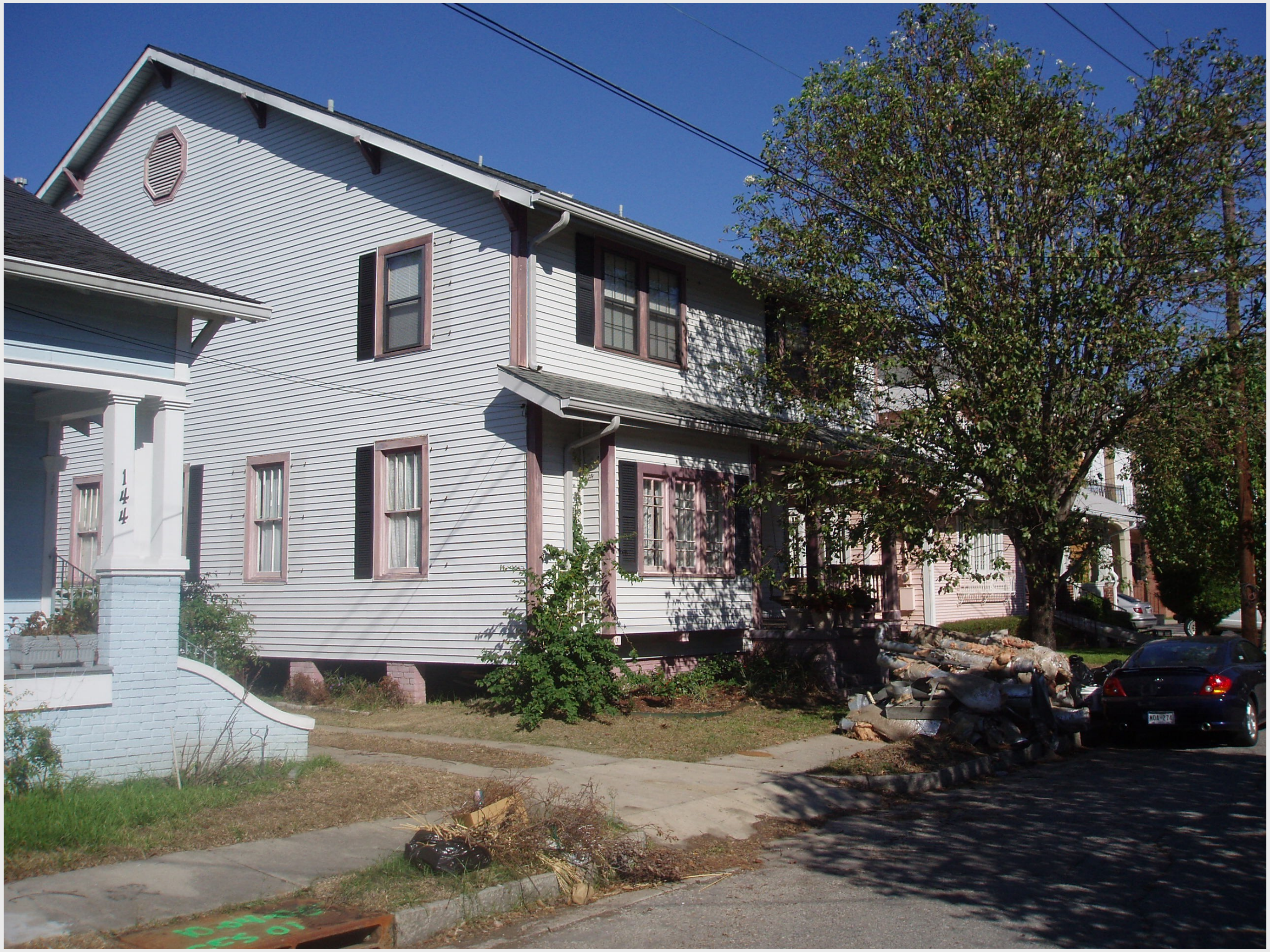
- **Vertical load and/or lateral force capacity has not been significantly decreased (building is structurally stable)**
- **Lawful occupancy permitted**

Green

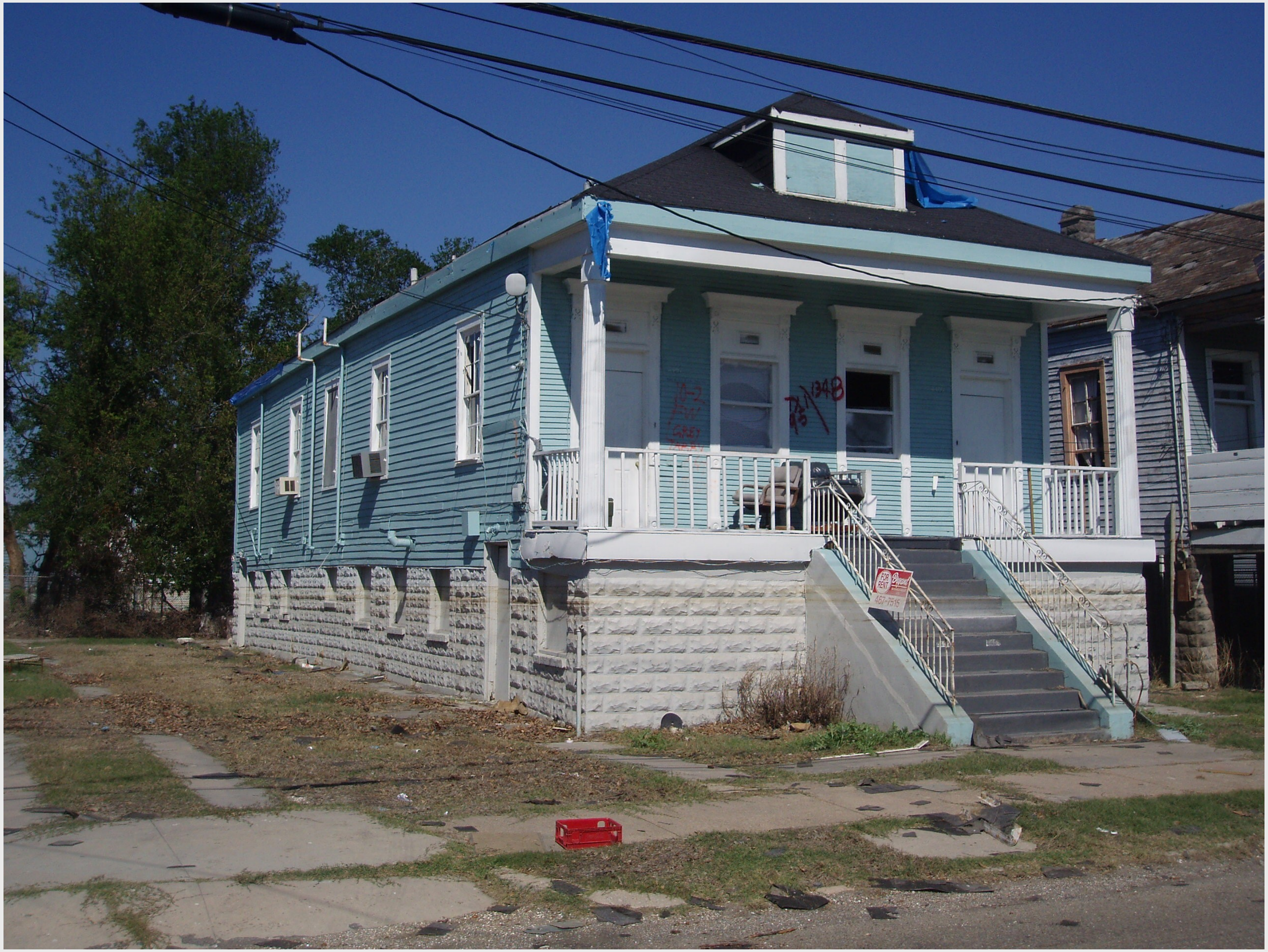
Green

Mediterranean Cafe
...Simply the Finest!
488-6088

Green



Green



Green

*Yellow **RESTRICTED USE** Posting*

- ***Definition***
  - **Building is damaged, may or may not be habitable**
  - **Falling or other hazards may be present**
  - **Damage is primarily due to flooding; some wind damage**

Yellow ***RESTRICTED USE*** *Posting*

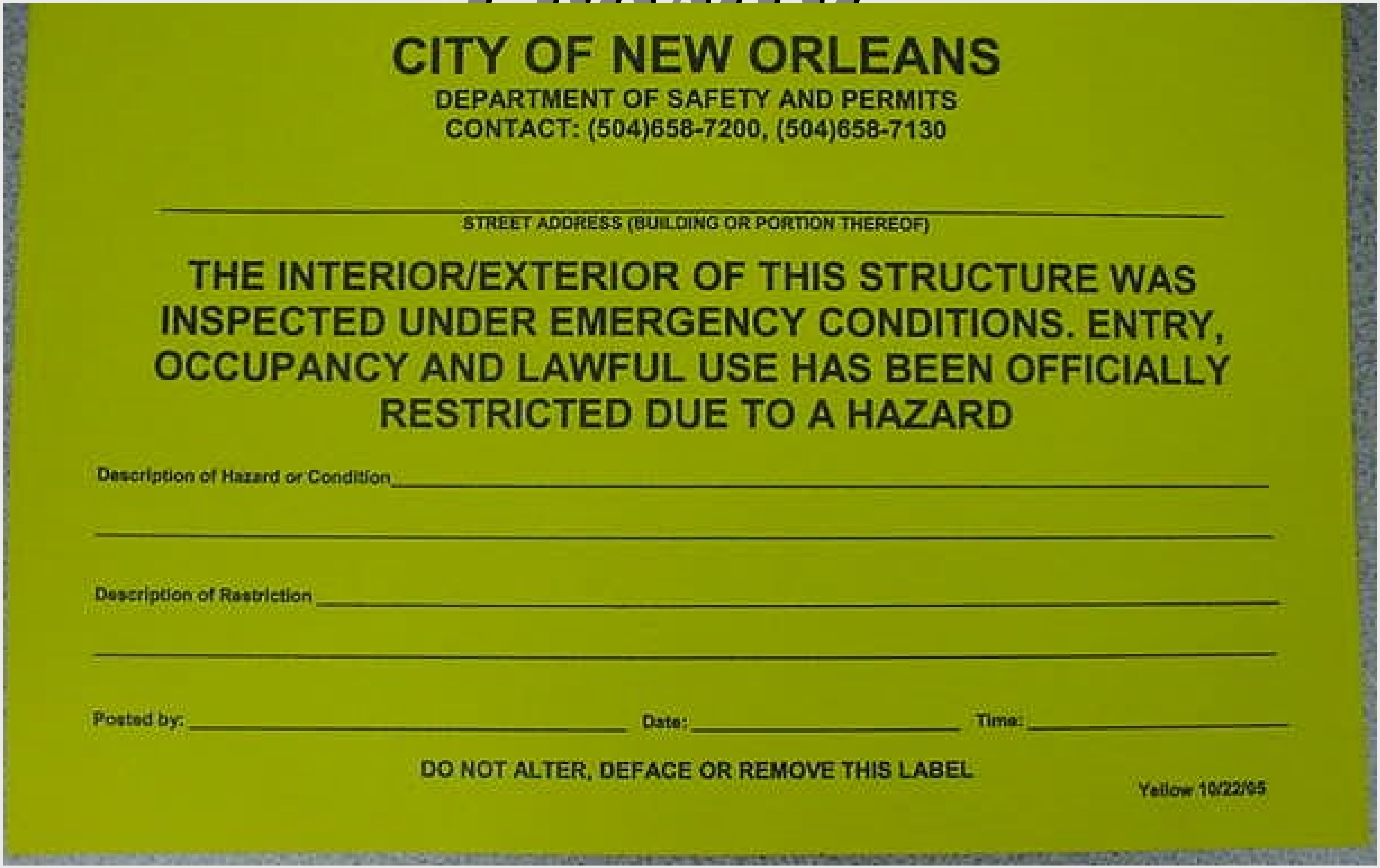
Definition (Cont’d)

- **There may be damage to lateral force and/or vertical load systems, still able to resist loads (some structural damage)**
- **Occupancy permitted per noted restrictions (i.e. unsafe areas; brief entry allowed, etc.)**

Yellow ***RESTRICTED USE*** *Posting*

- ***Definition (Cont’d)***
  - **All flooded buildings will be yellow, unless significant structural damage or life threatening hazards (red posting)**
  - **Damage may be due to flooding or wind or both**

City of New Orleans Yellow Placard



CITY OF NEW ORLEANS

DEPARTMENT OF SAFETY AND PERMITS

CONTACT: (504)658-7200, (504)658-7130

____

STREET ADDRESS (BUILDING OR PORTION THEREOF)

THE INTERIOR/EXTERIOR OF THIS STRUCTURE WAS INSPECTED UNDER EMERGENCY CONDITIONS. ENTRY, OCCUPANCY AND LAWFUL USE HAS BEEN OFFICIALLY RESTRICTED DUE TO A HAZARD

Description of Hazard or Condition ______________________________

____

Description of Restriction ______________________________

____

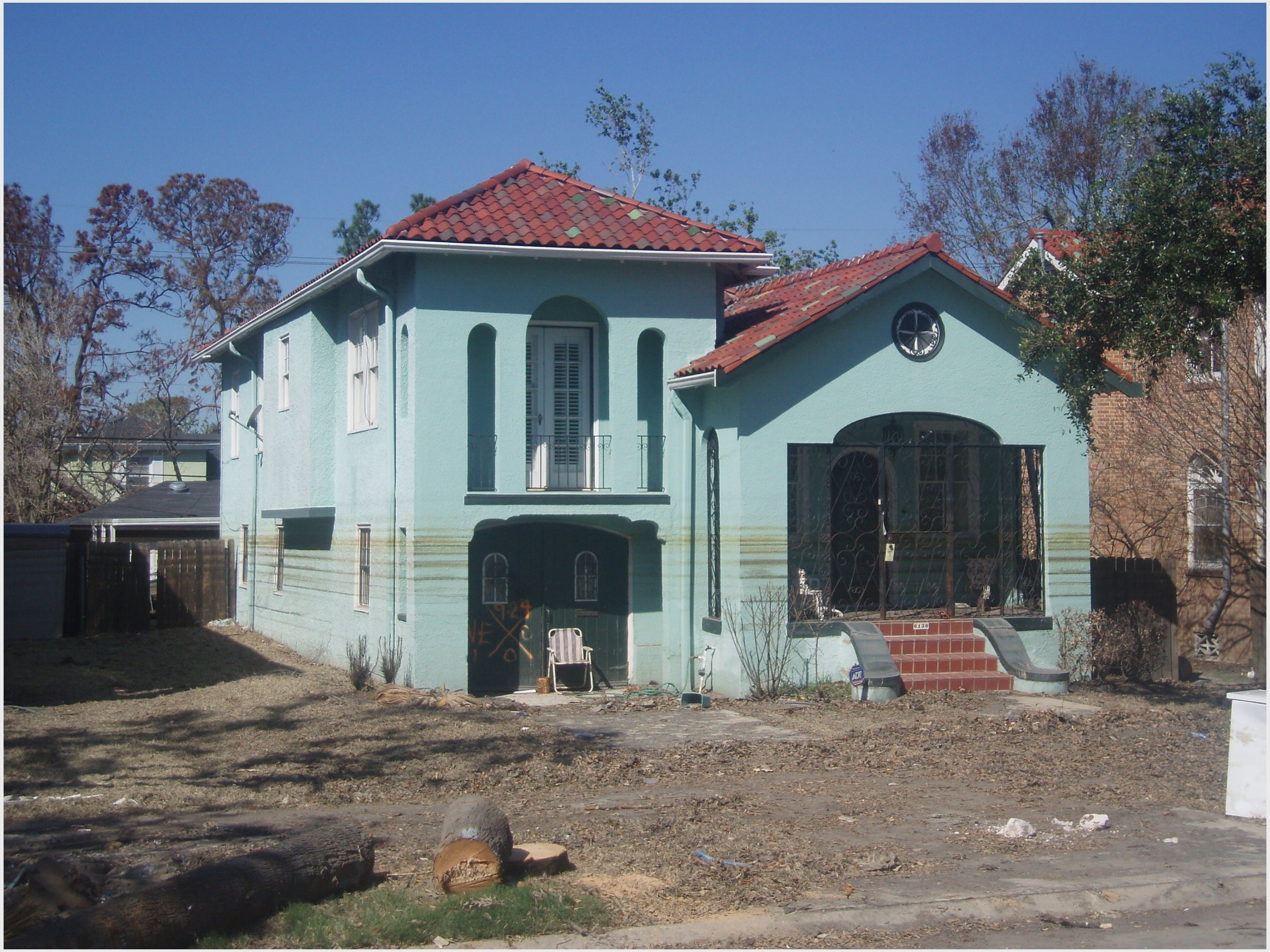
Posted by: ______________ Date: ______________ Time: ______________

DO NOT ALTER, DEFACE OR REMOVE THIS LABEL

Yellow 10/22/05

Yellow

Yellow

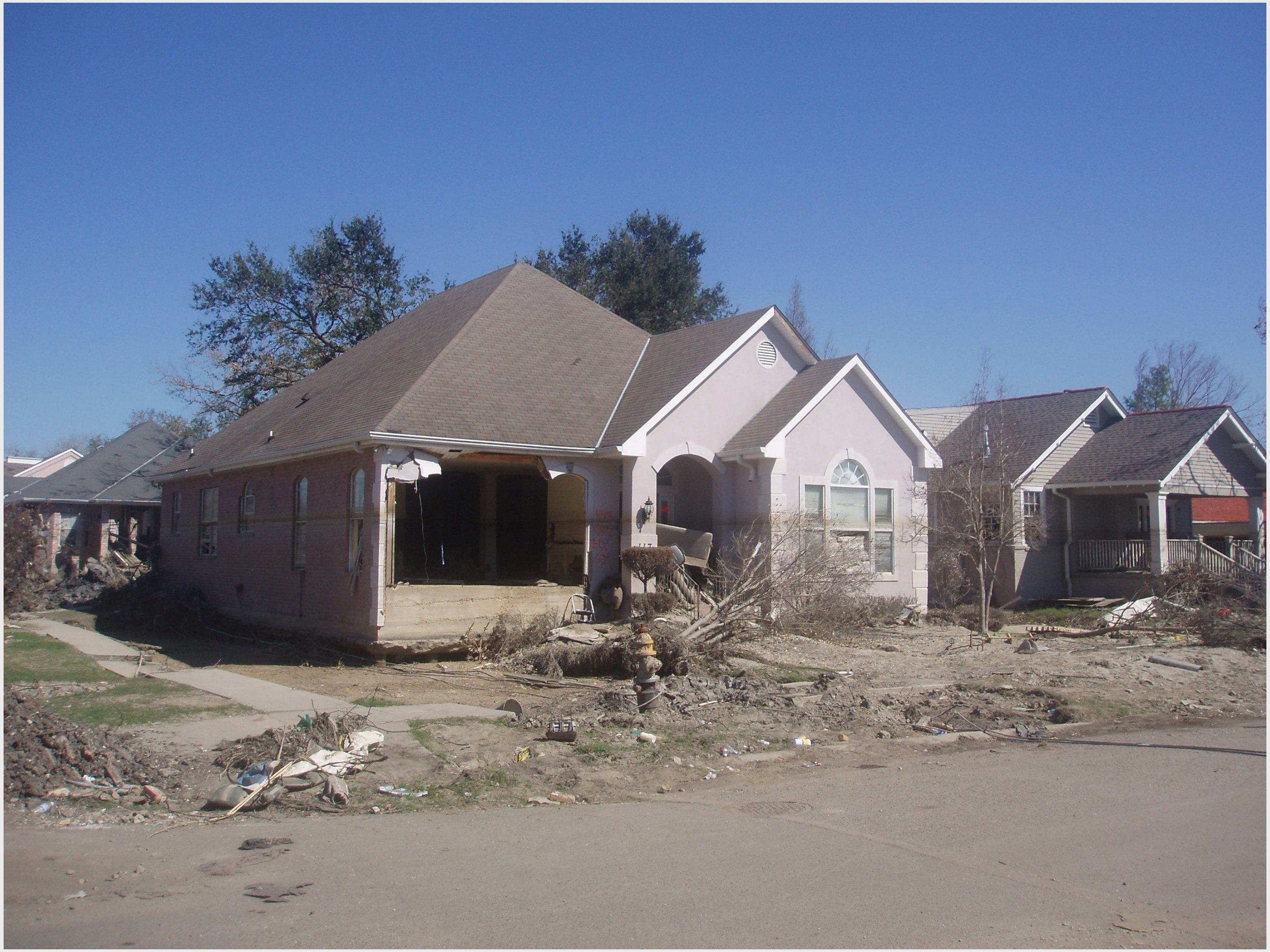


Yellow

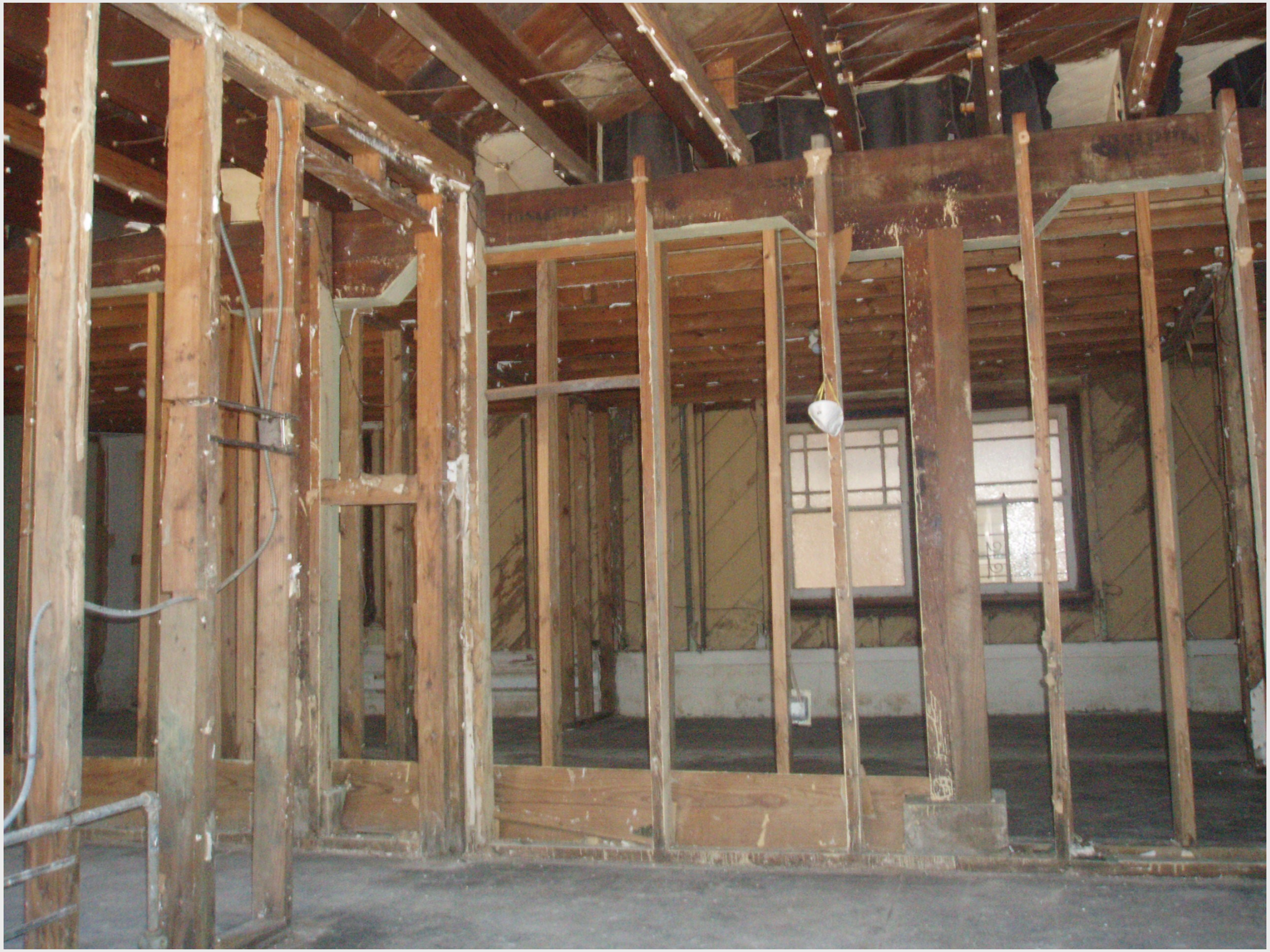
PANDORA'S
PANDORA'S SNOBALLS
ORDER HERE
901
REGULAR FLAVORS
CREAM FLAVORS
HOMEMADE HOT TAMALES 6.00 A DOZEN
ORDER PICK-UP HERE
BARBER SHOP
Hair Clinic
483-0908

Yellow

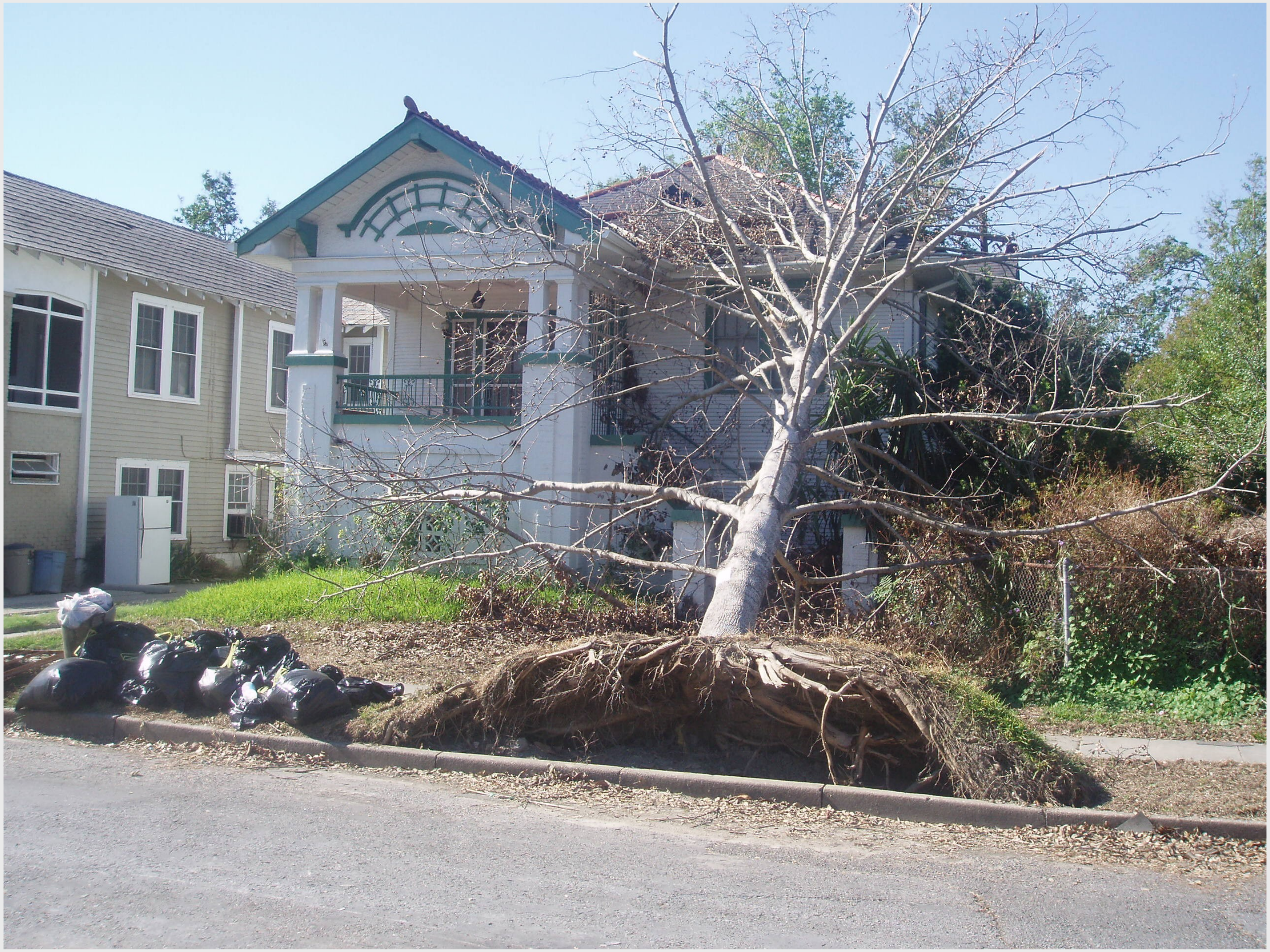
Yellow (Lakeview)



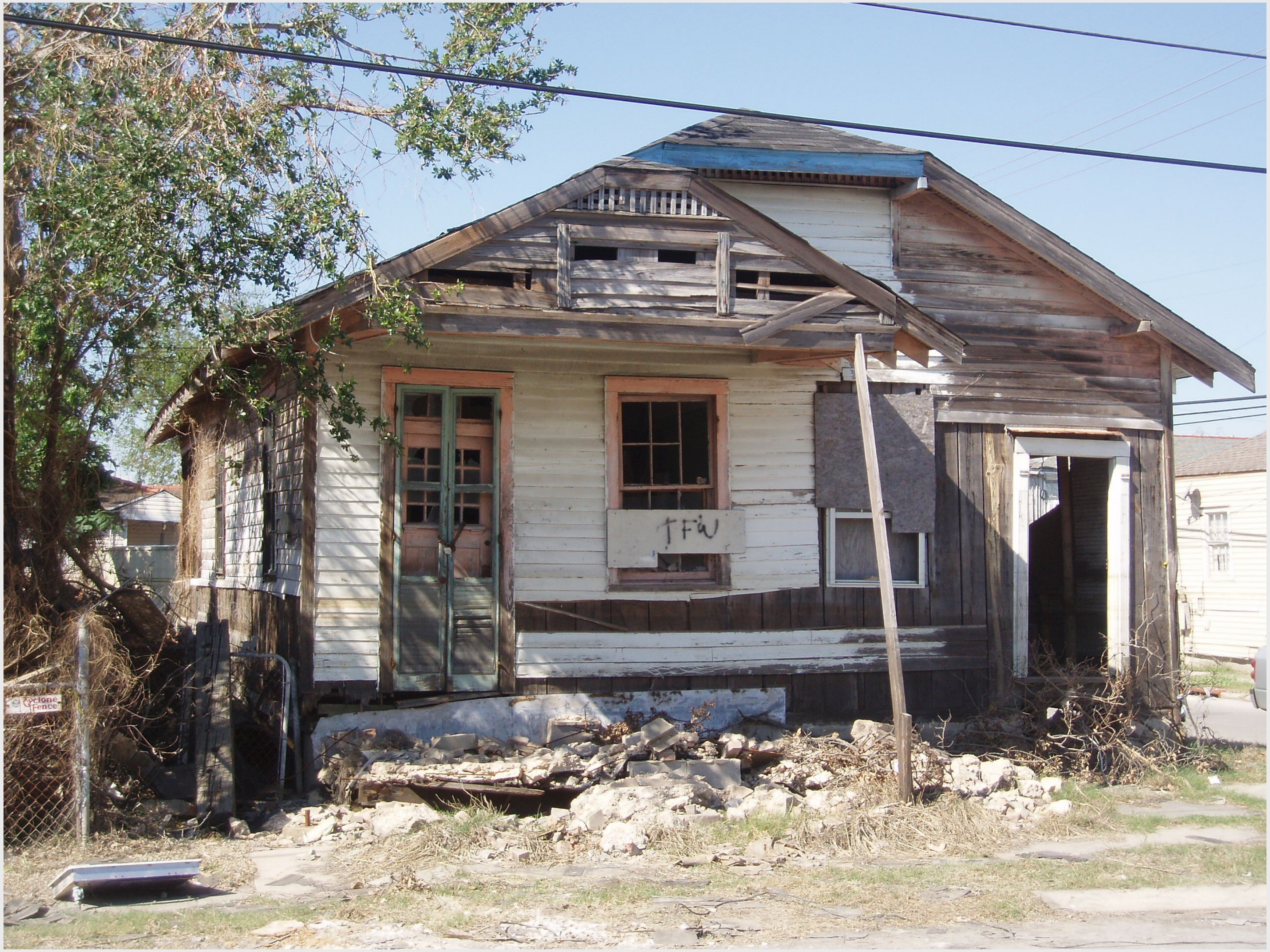
Yellow



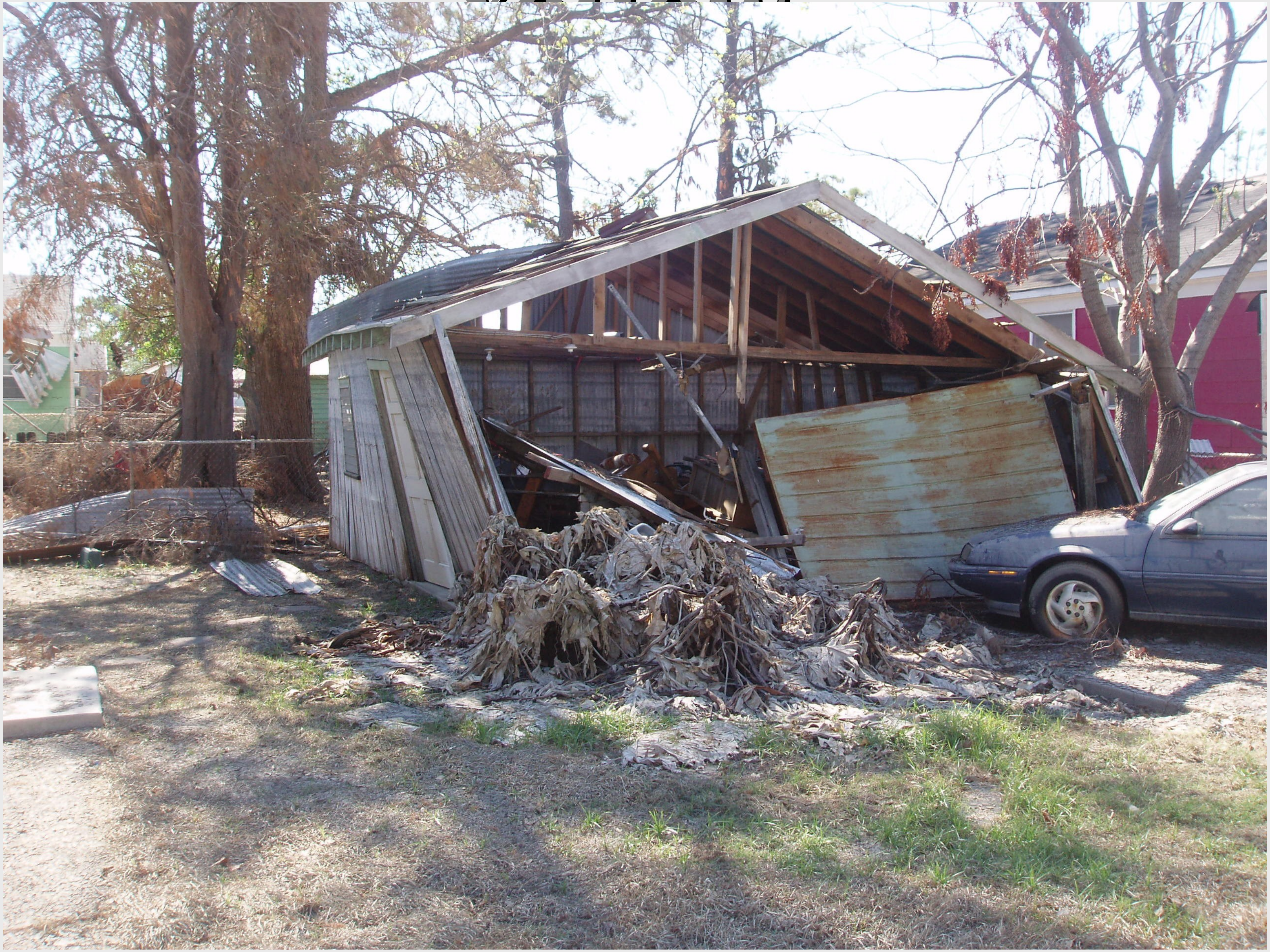
Yellow



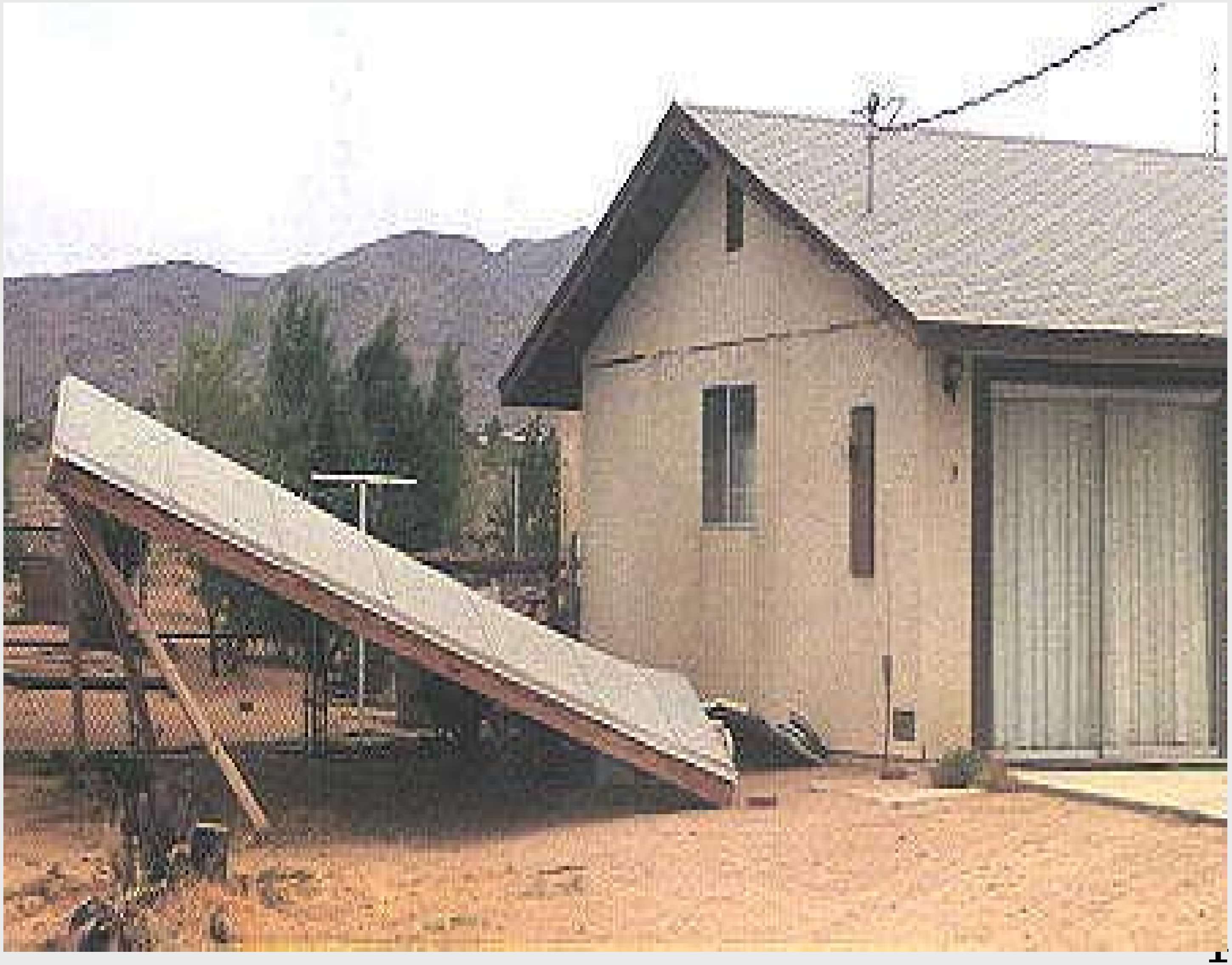
Yellow


TFW
Cyclone Fence

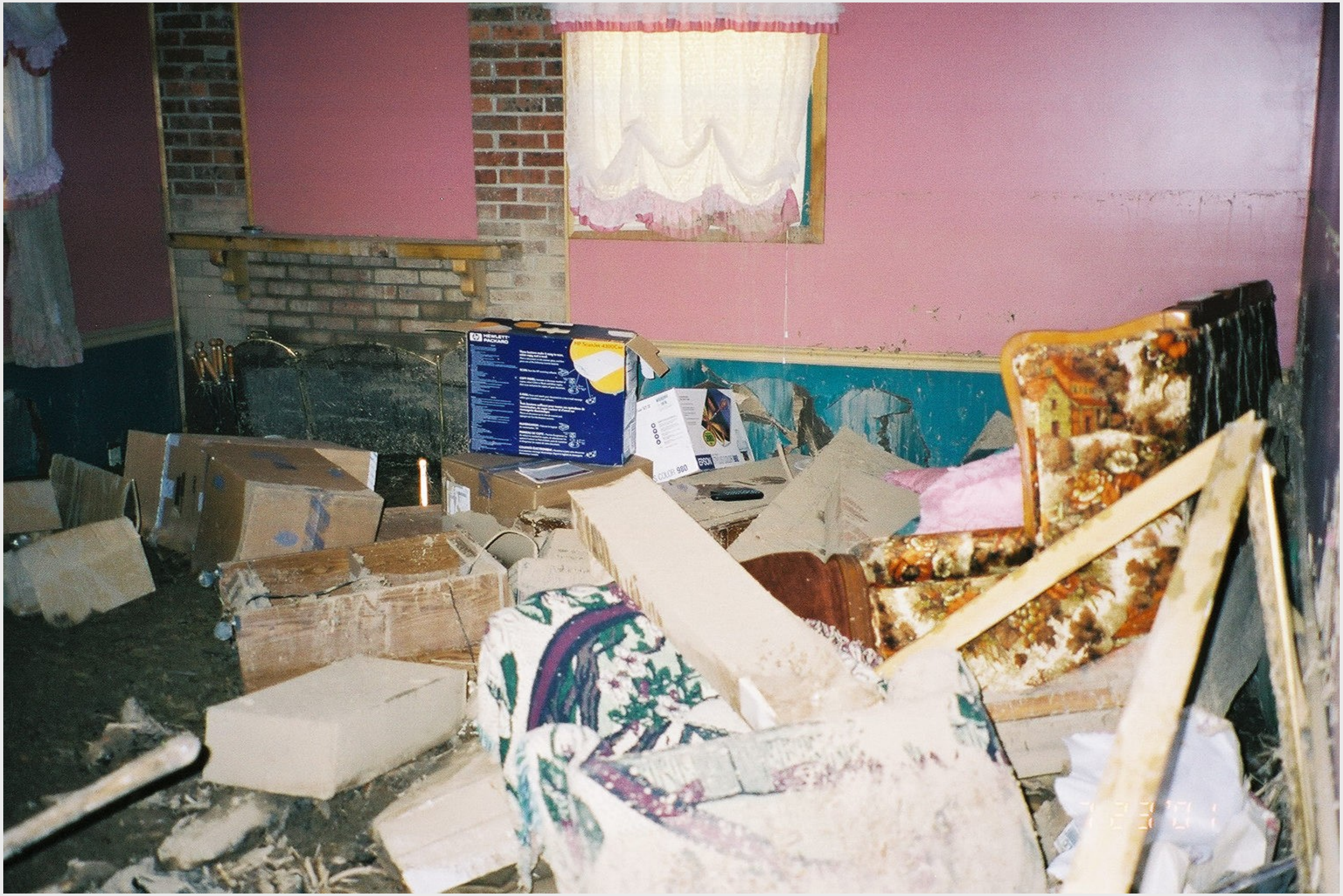
Yellow



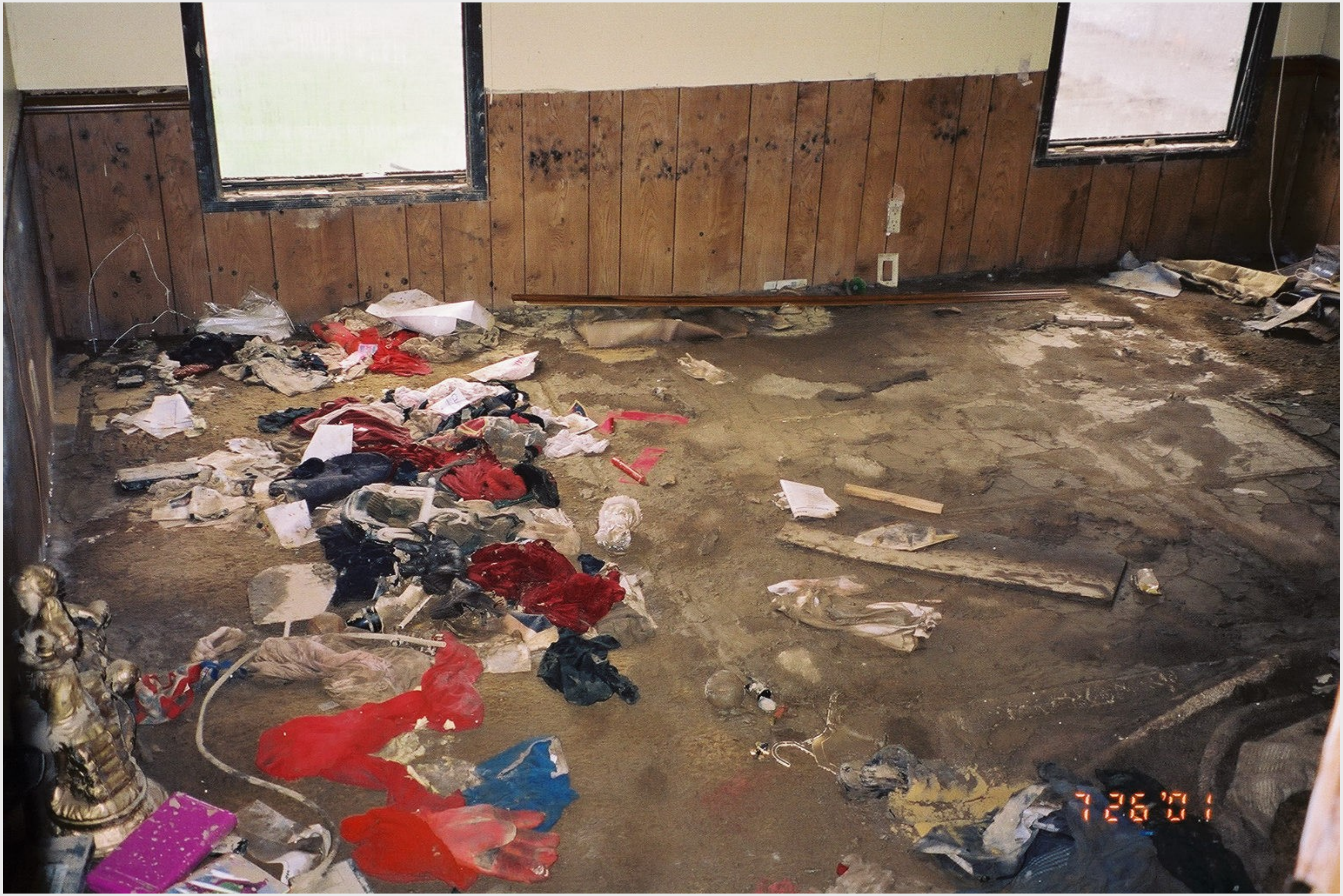
Yellow



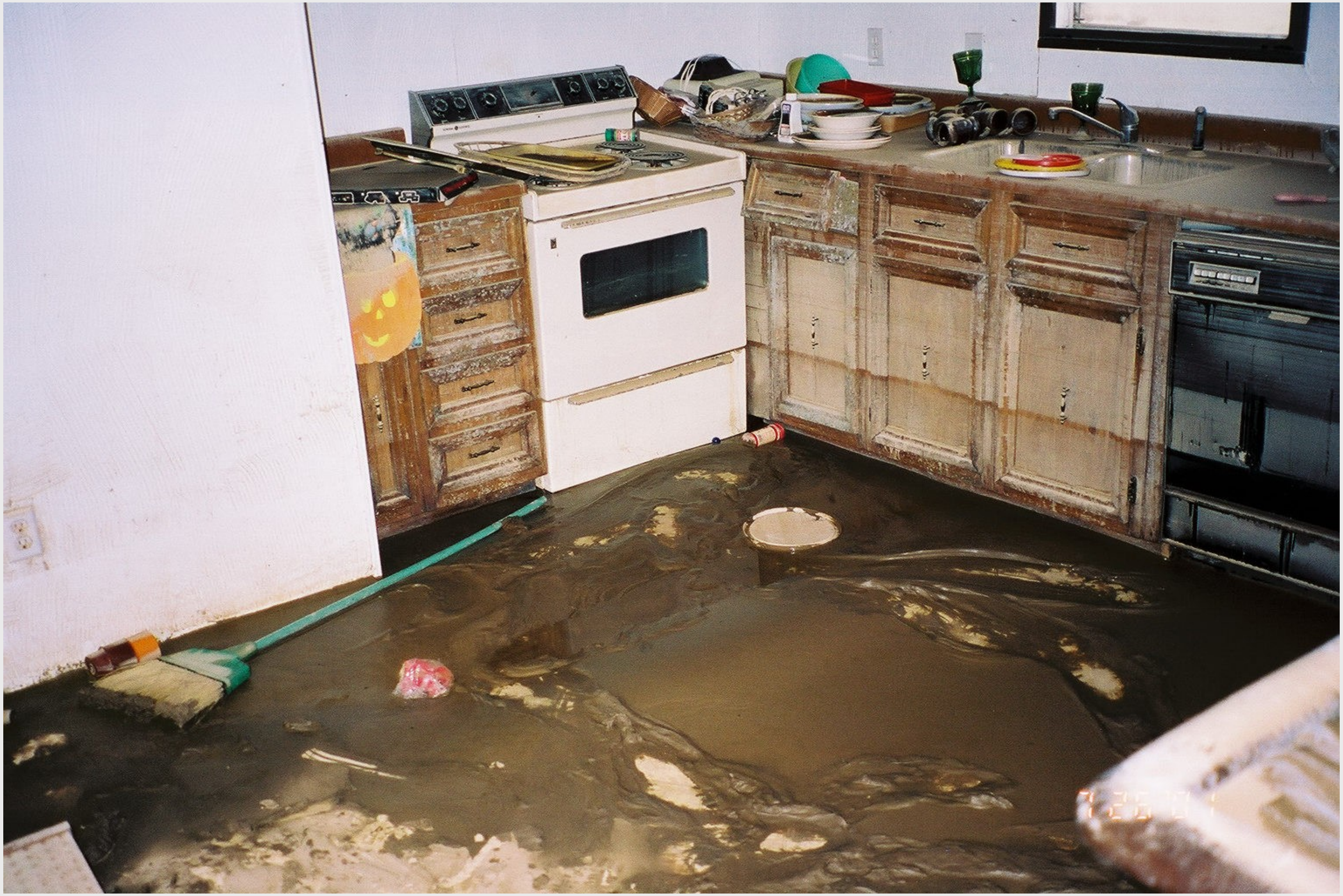
Yellow


HEWLETT PACKARD
EPSON
COLOR 980
7 23 '01

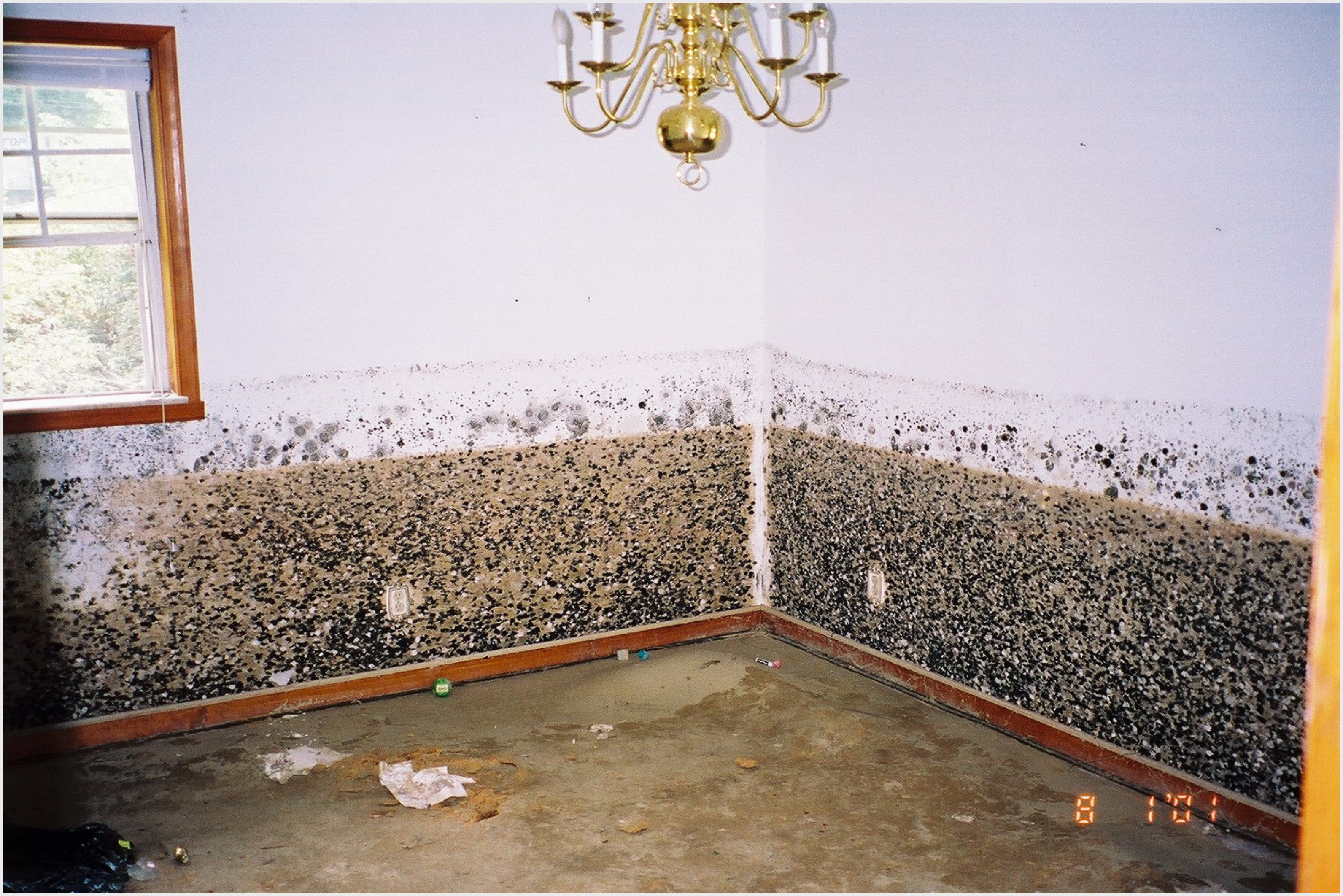
Yellow



Yellow



Yellow



*Red **UNSAFE** Posting*

- ***Definition***
  - **Significant decrease in vertical load and/or lateral force capacity (building is structurally unstable)**
  - **Extreme hazard, building may collapse or has collapsed (includes fire damage from hurricane)**
  - **Damage may be due to flooding or wind or both**

Red **UNSAFE** Posting

- ***Definition (cont'd)***

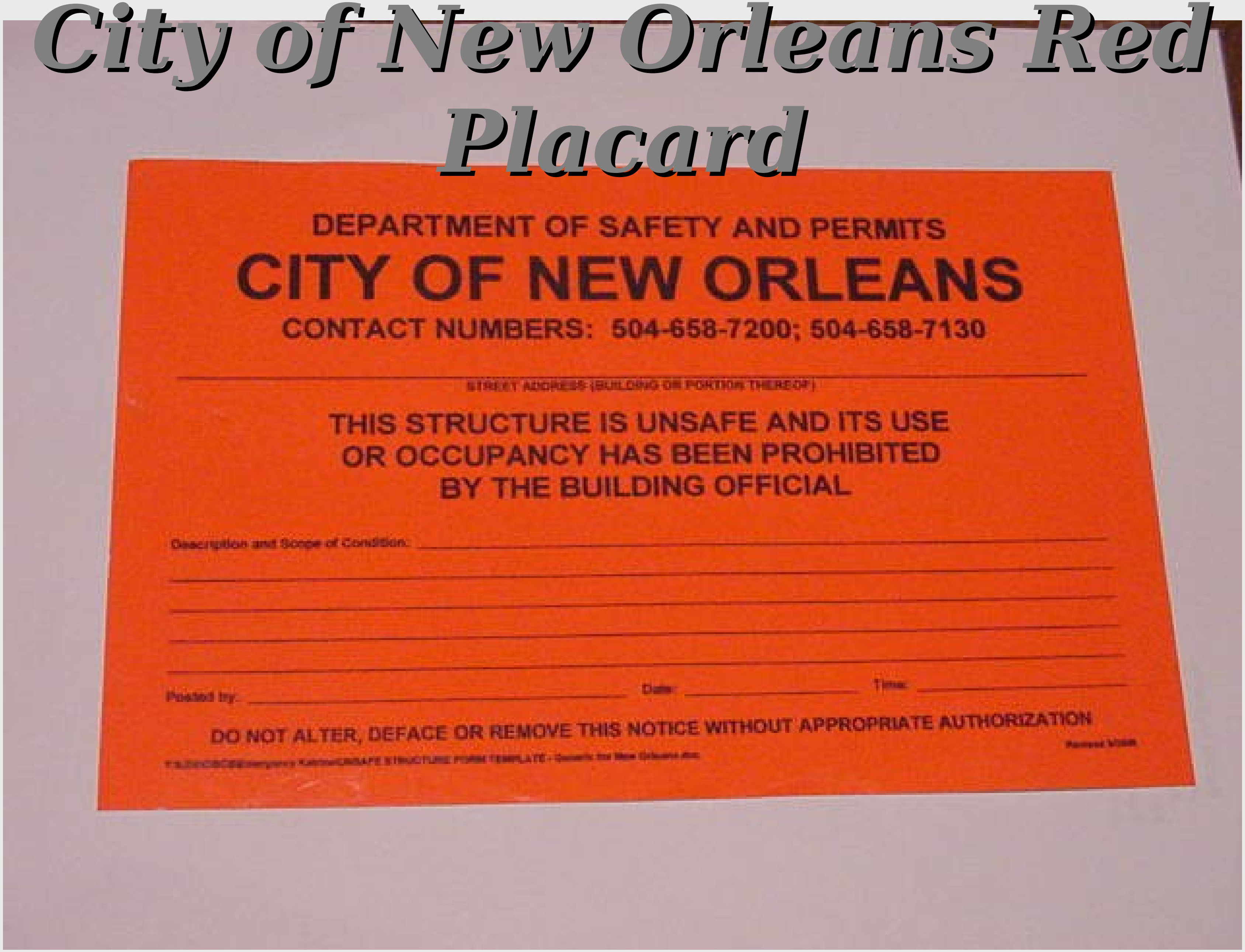
  - **Imminent danger of collapse from static conditions, wind, dilapidation, or other events**

  - **Other significant threat to life and safety (i.e. leaking gas line; energized electrical lines)**

*Red **UNSAFE** Posting*

- ***Definition (cont'd)***
  - **Unsafe for occupancy or entry; authorities may enter if necessary and conditions warrant**
  - **Does not necessarily mean demolition; building may be repairable**

City of New Orleans Red Placard



DEPARTMENT OF SAFETY AND PERMITS

CITY OF NEW ORLEANS

CONTACT NUMBERS: 504-658-7200; 504-658-7130

STREET ADDRESS (BUILDING OR PORTION THEREOF)

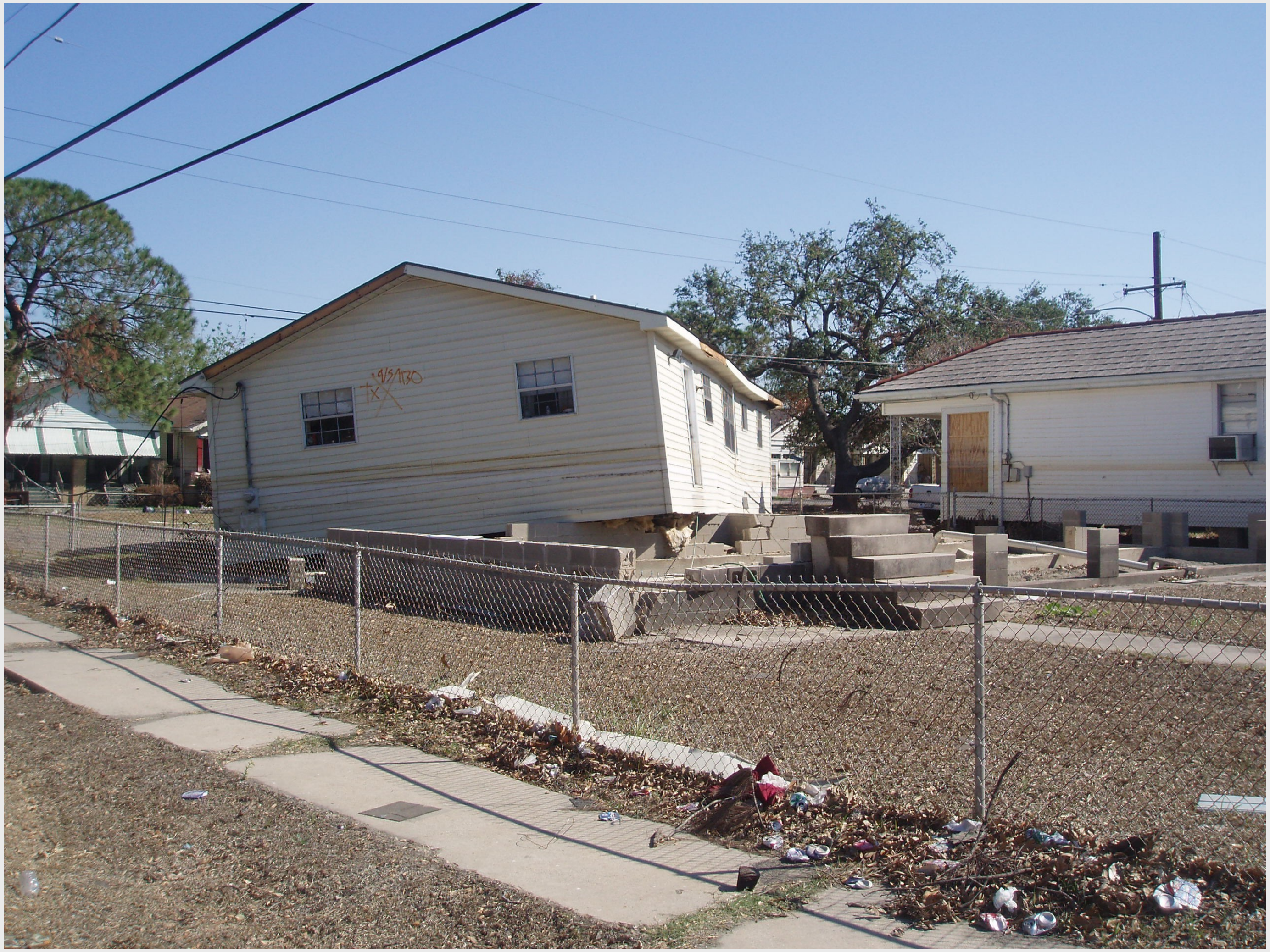
THIS STRUCTURE IS UNSAFE AND ITS USE OR OCCUPANCY HAS BEEN PROHIBITED BY THE BUILDING OFFICIAL

Description and Scope of Condition:

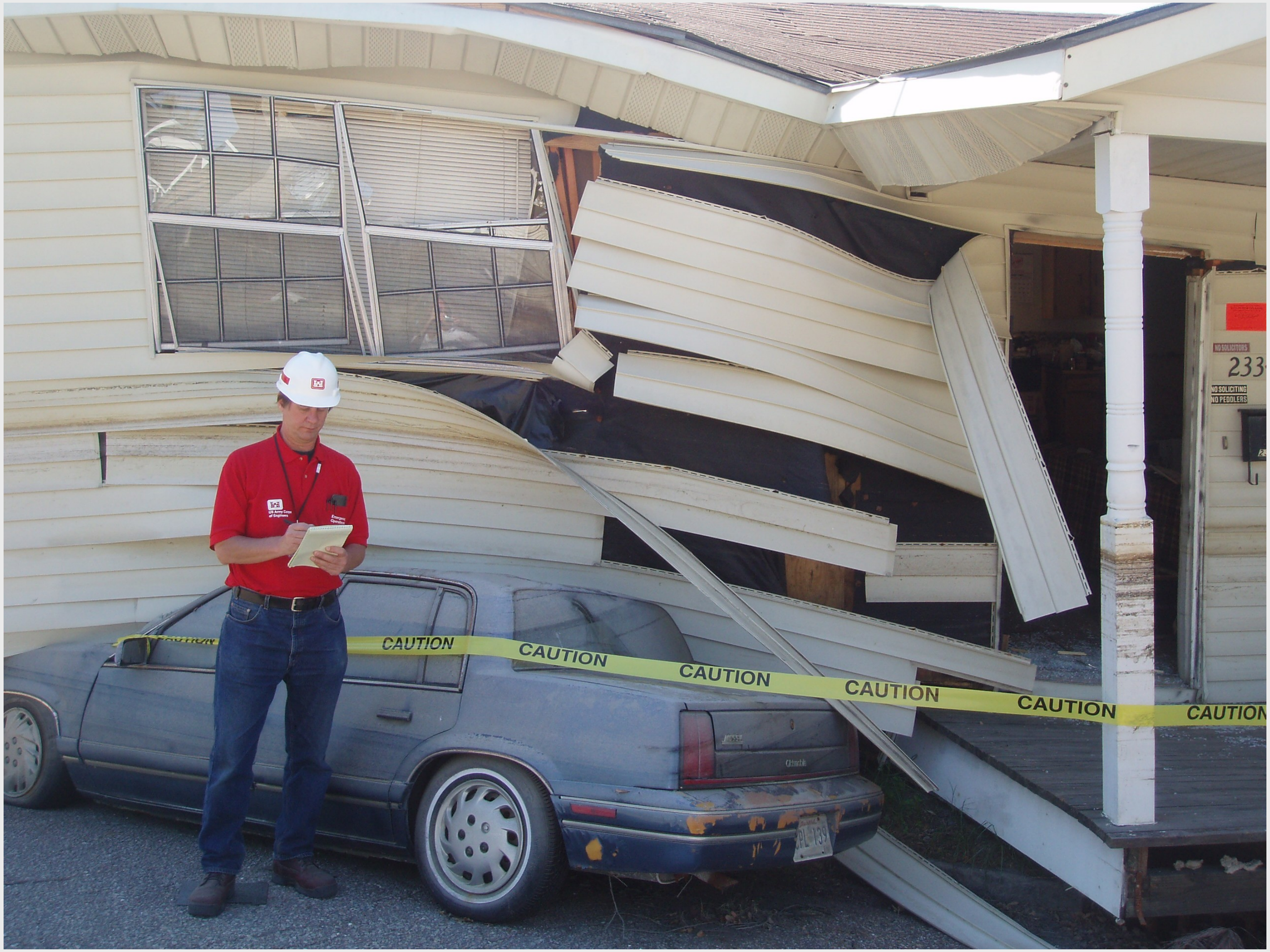
Posted by: Date: Time:

DO NOT ALTER, DEFACE OR REMOVE THIS NOTICE WITHOUT APPROPRIATE AUTHORIZATION

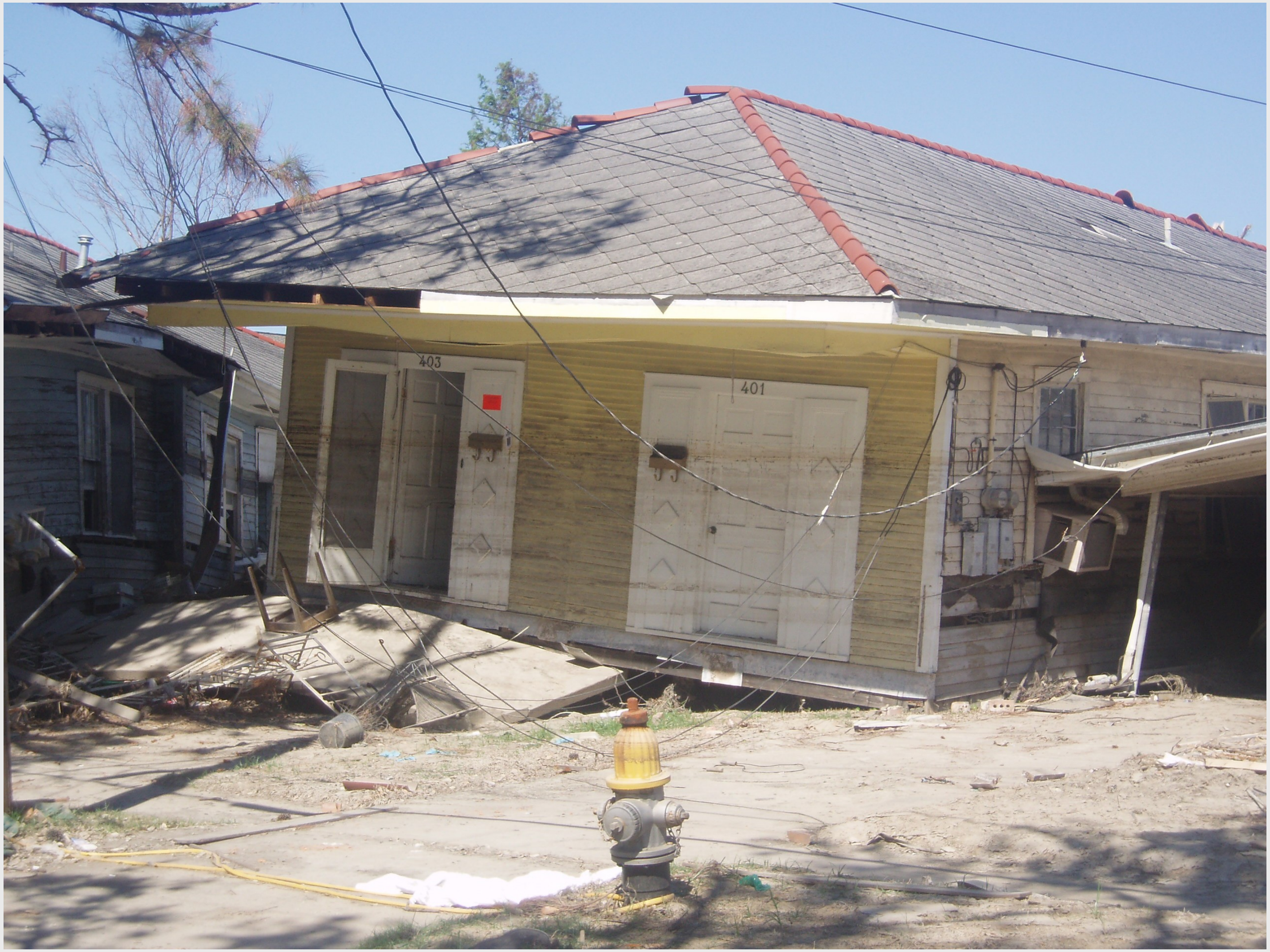
Red (Mid City)



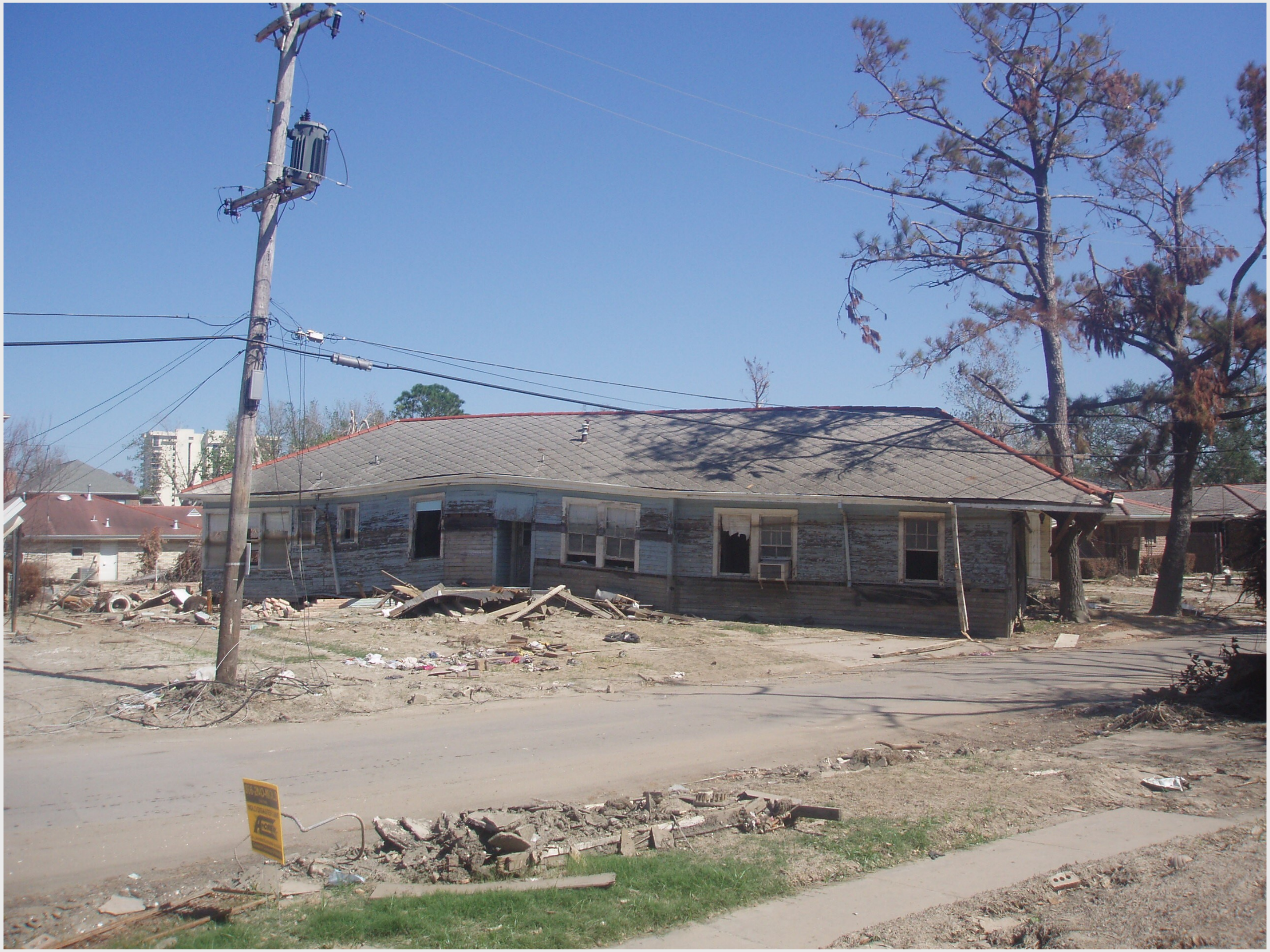
Red (Mid City)


CAUTION
CAUTION
CAUTION
CAUTION
CAUTION
CAUTION
NO SOLICITORS
233
NO SOLICITING
NO PEDDLERS
US Army Corps of Engineers

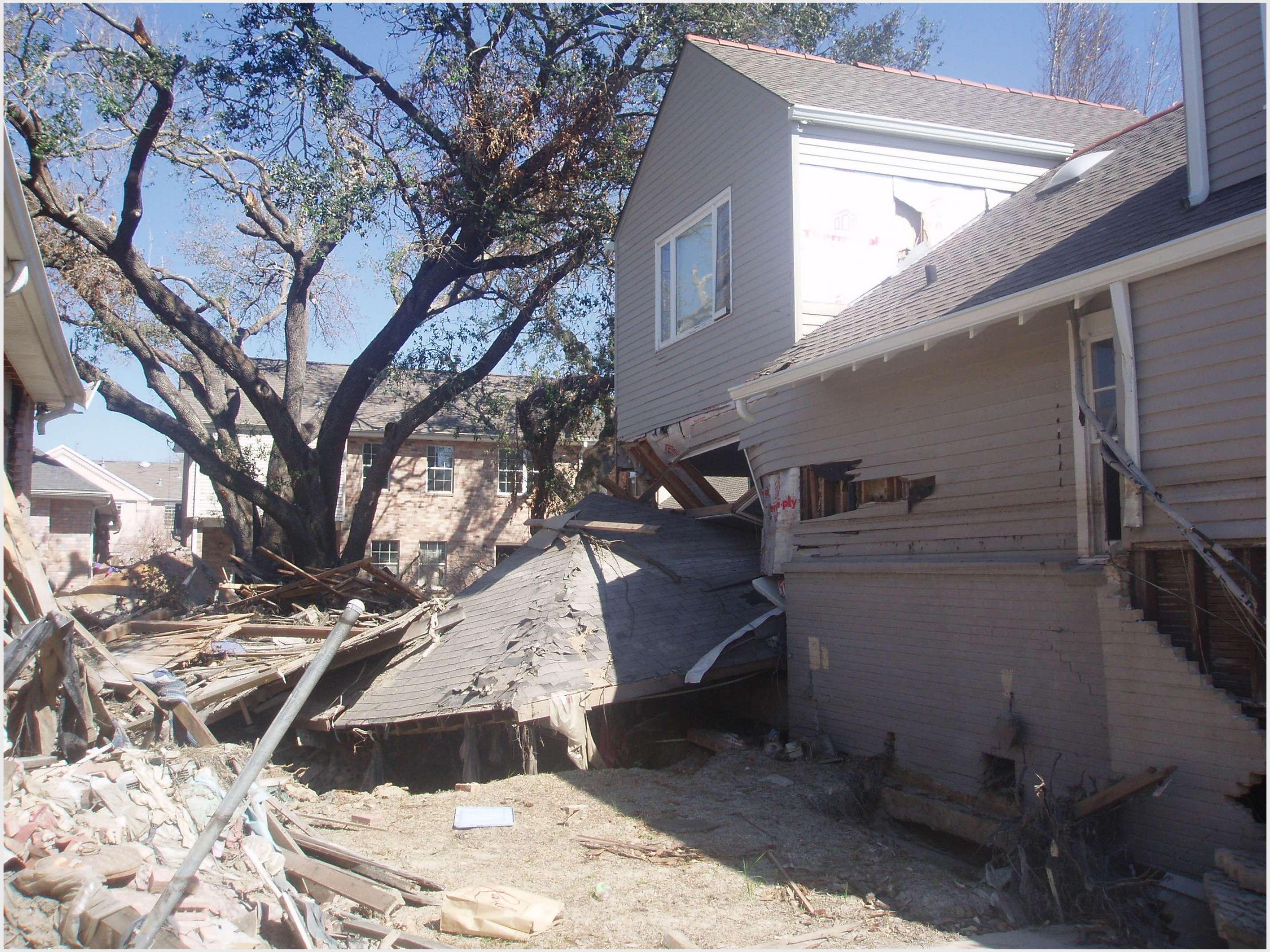
Red (Lakeview)



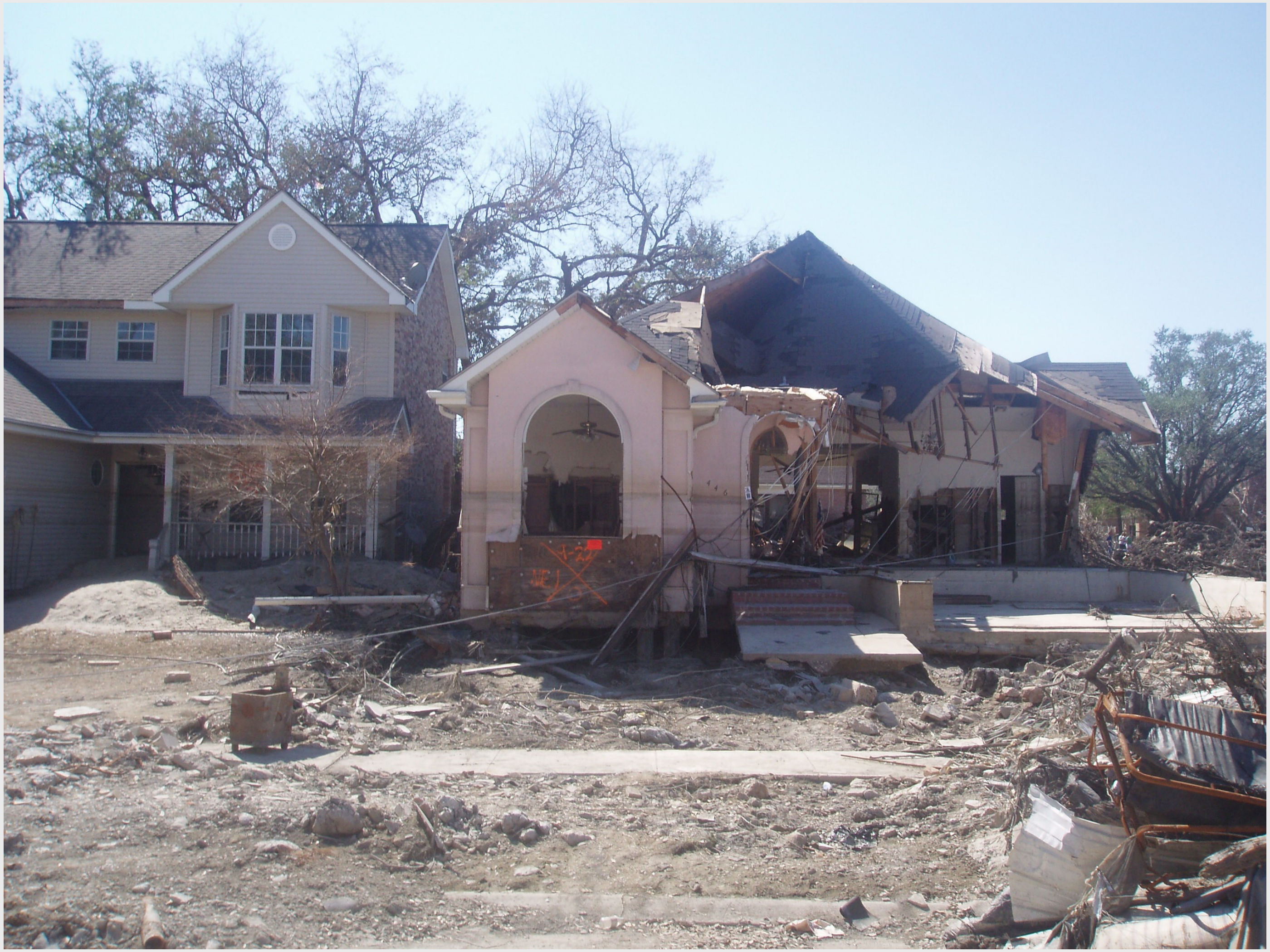
Red (Lakeview)



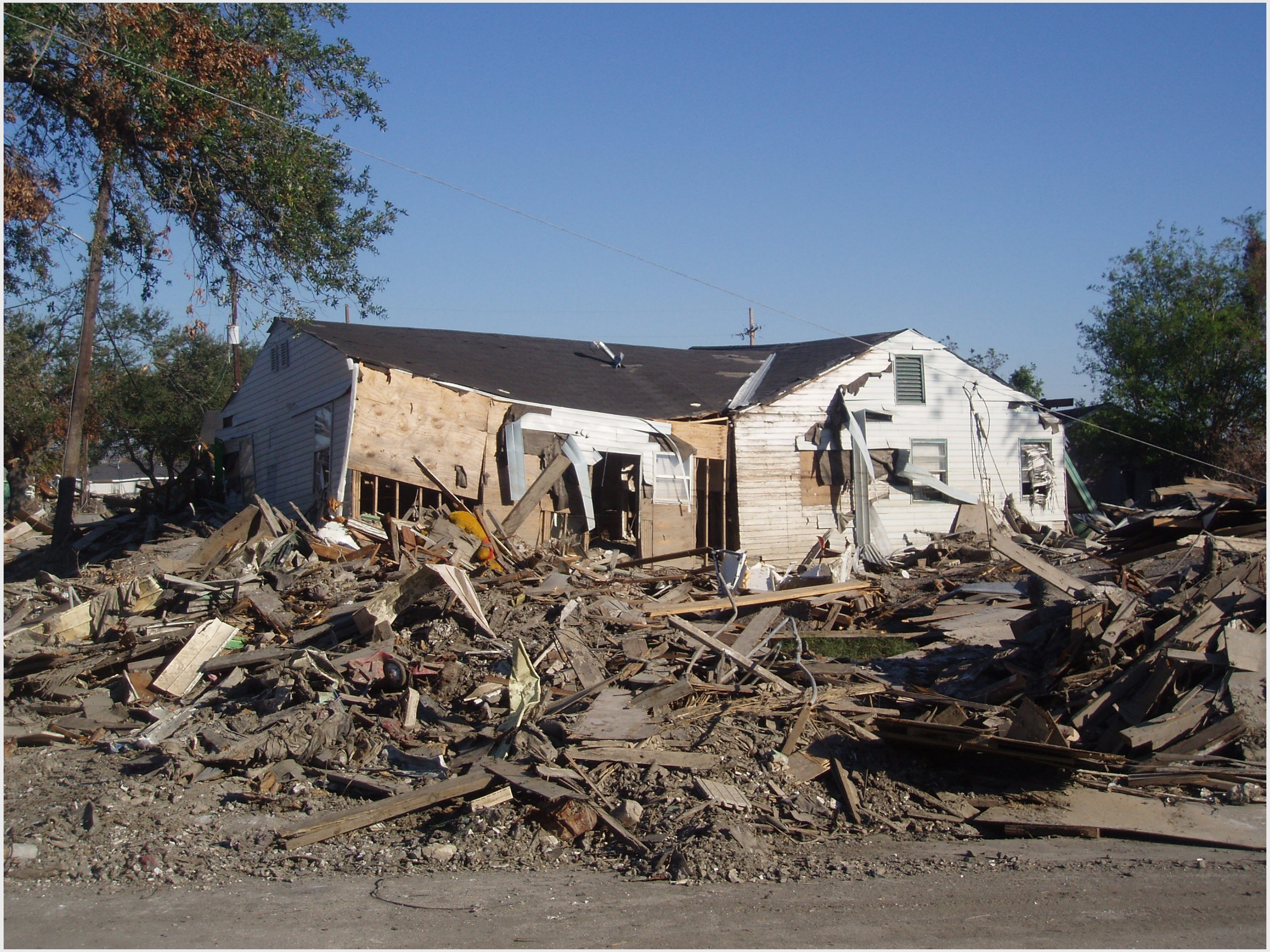
Red (Lakeview)



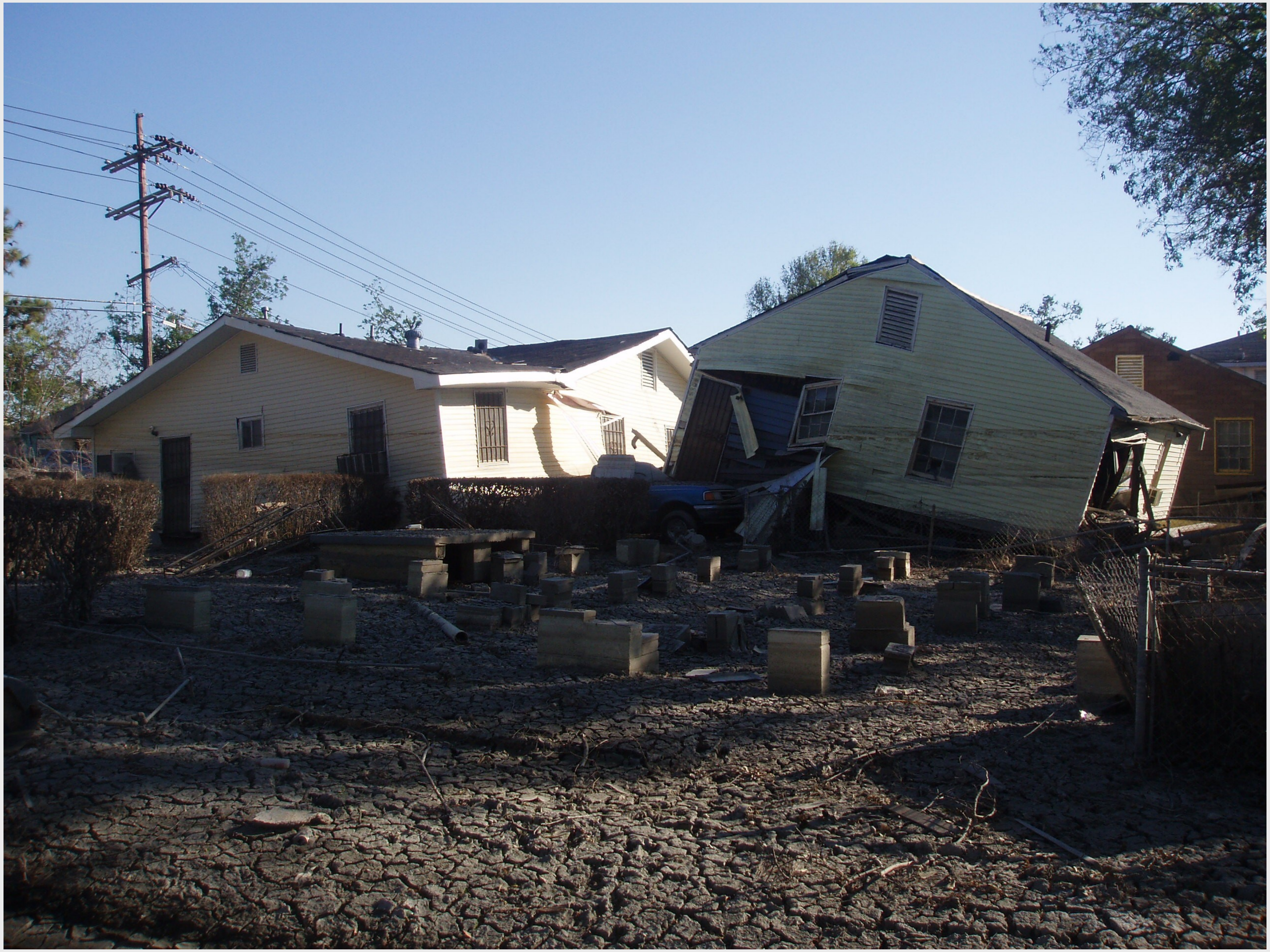
Red (Lakeview)



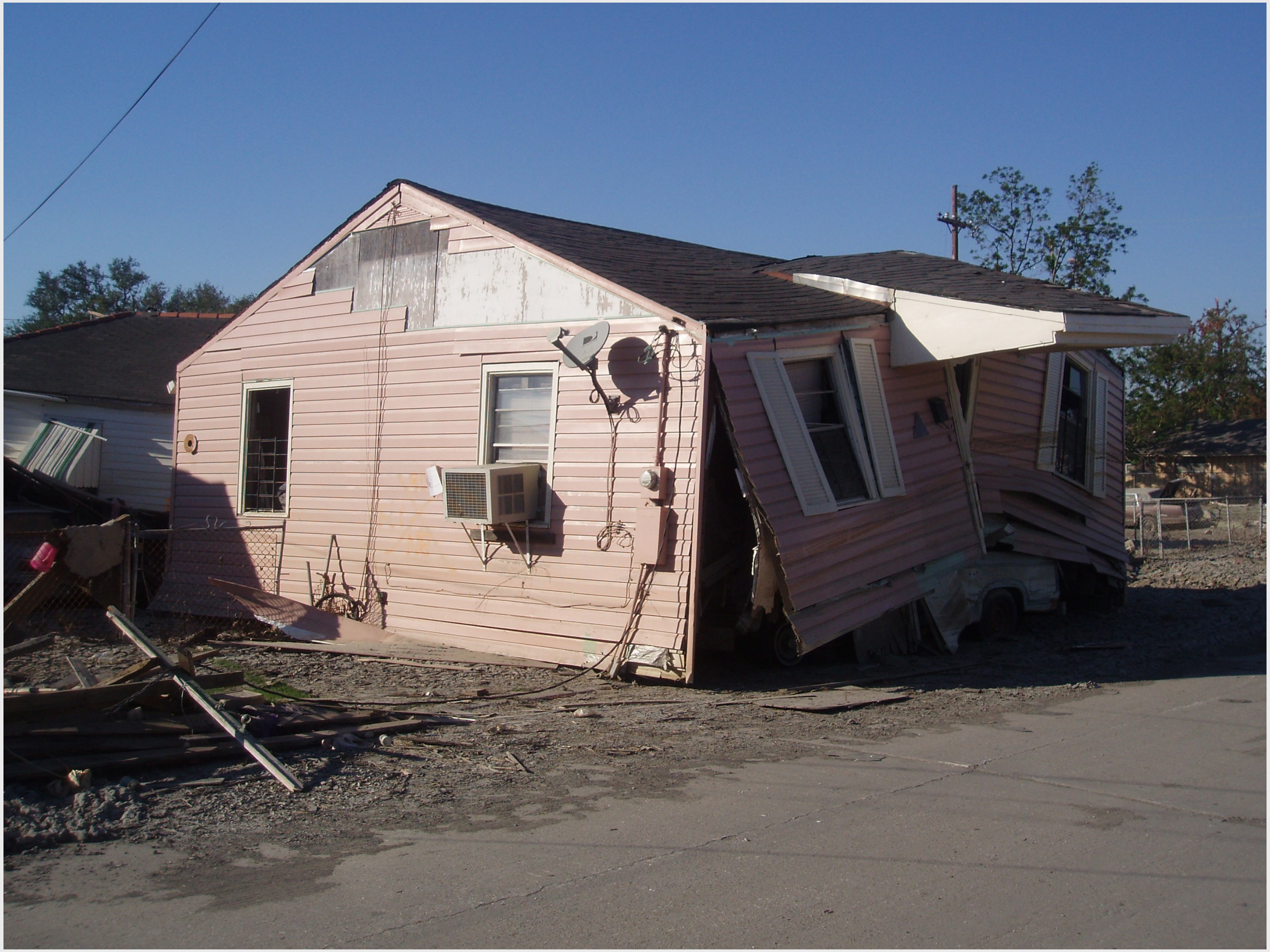
Red (9th Ward)



Red (9th Ward)



Red (9th Ward)



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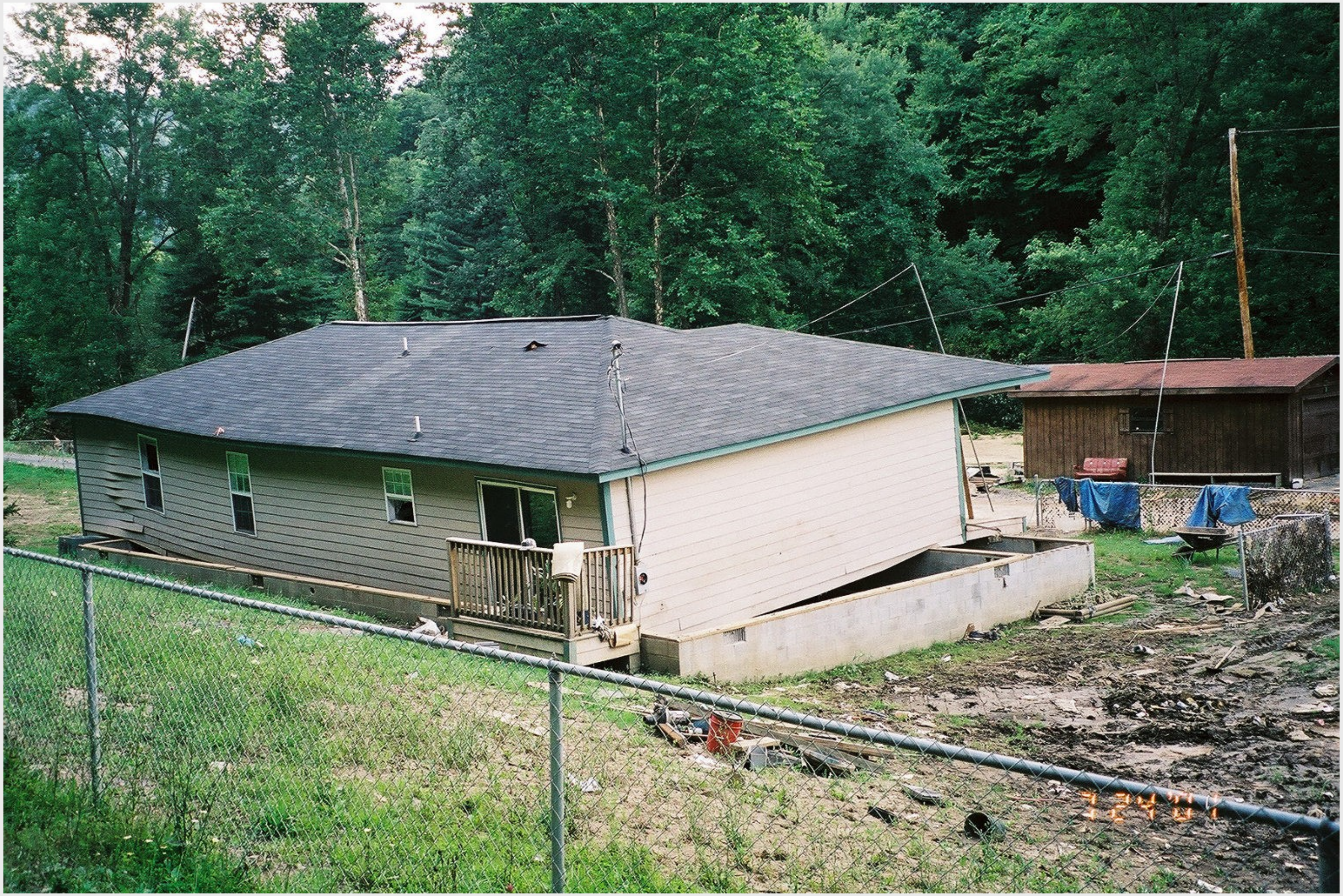
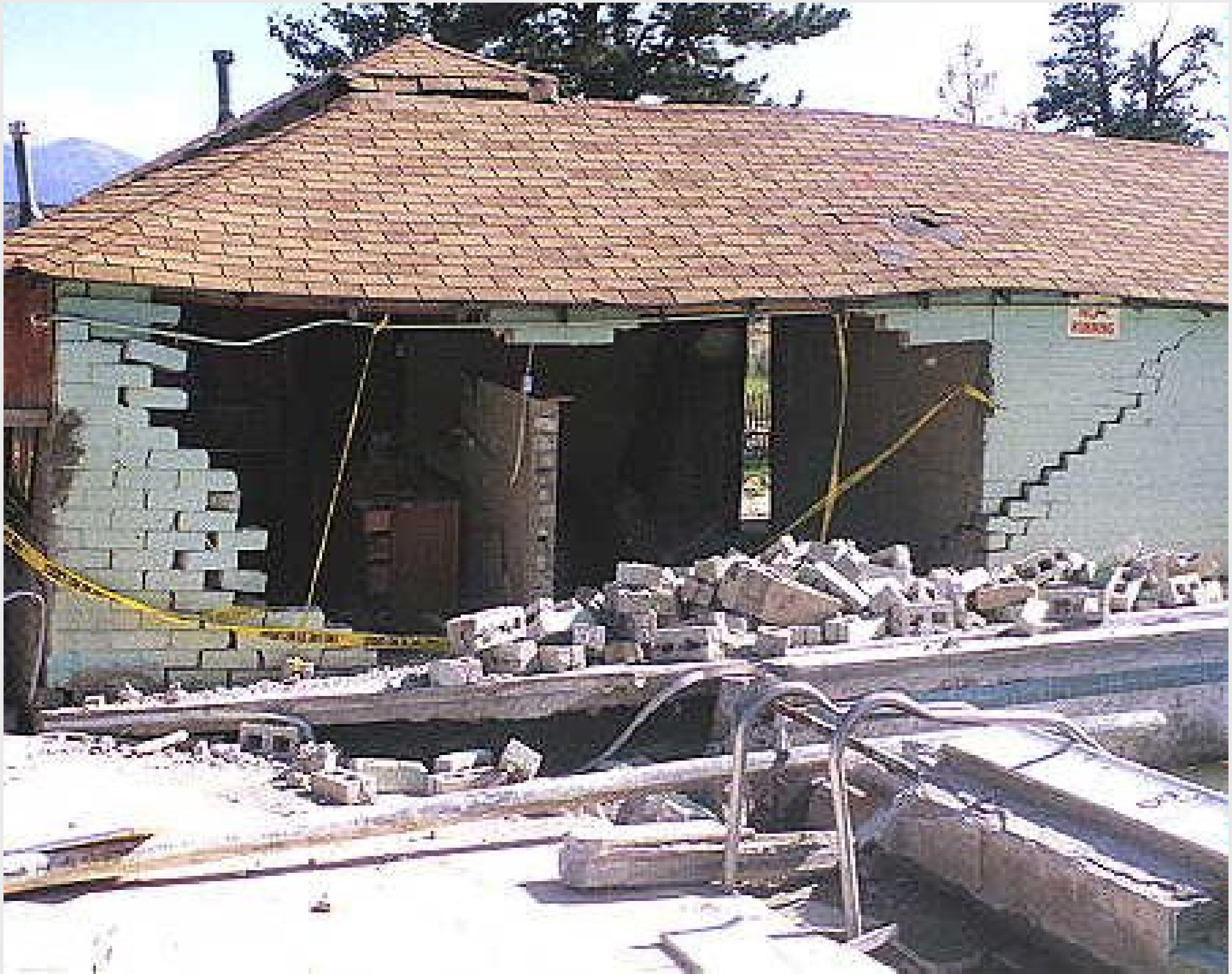
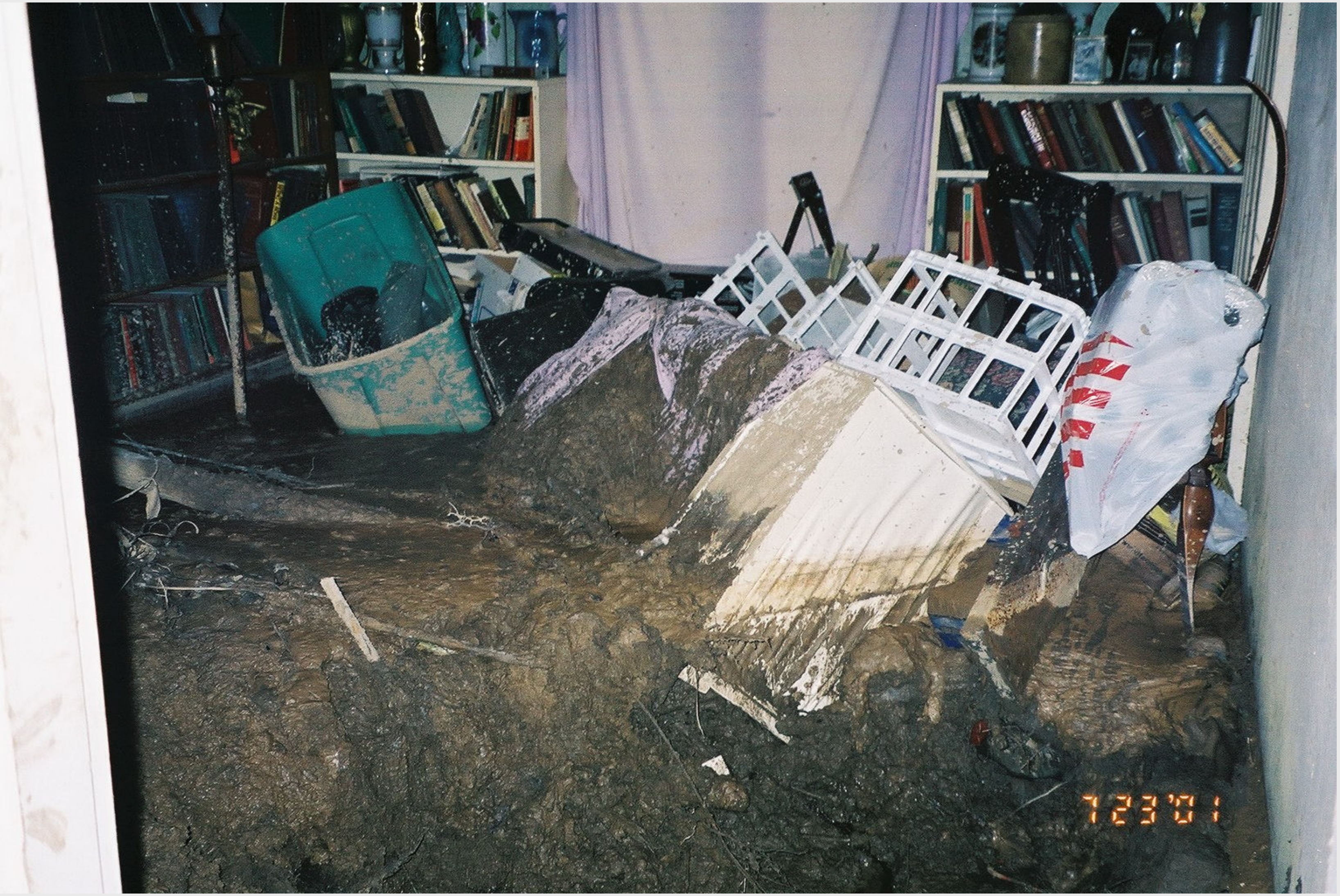


Red (WVA)



Red



Labeling Structure Placards

- *Will only be posting some yellow placards and all red placards*
- *All green placards and most yellow placards will not be posted)*

Labeling Structure Placards (cont'd)

- *Yellow (Restricted Use):* *Indicate* *on placard* *and on form any structural or non-structural hazards.* *Do not post yellow placards for simply flooded buildings!*

- *Red (Unsafe):* *Indicate* *on placard* *and on form any structural hazards*

Labeling Structure Placards (cont'd)

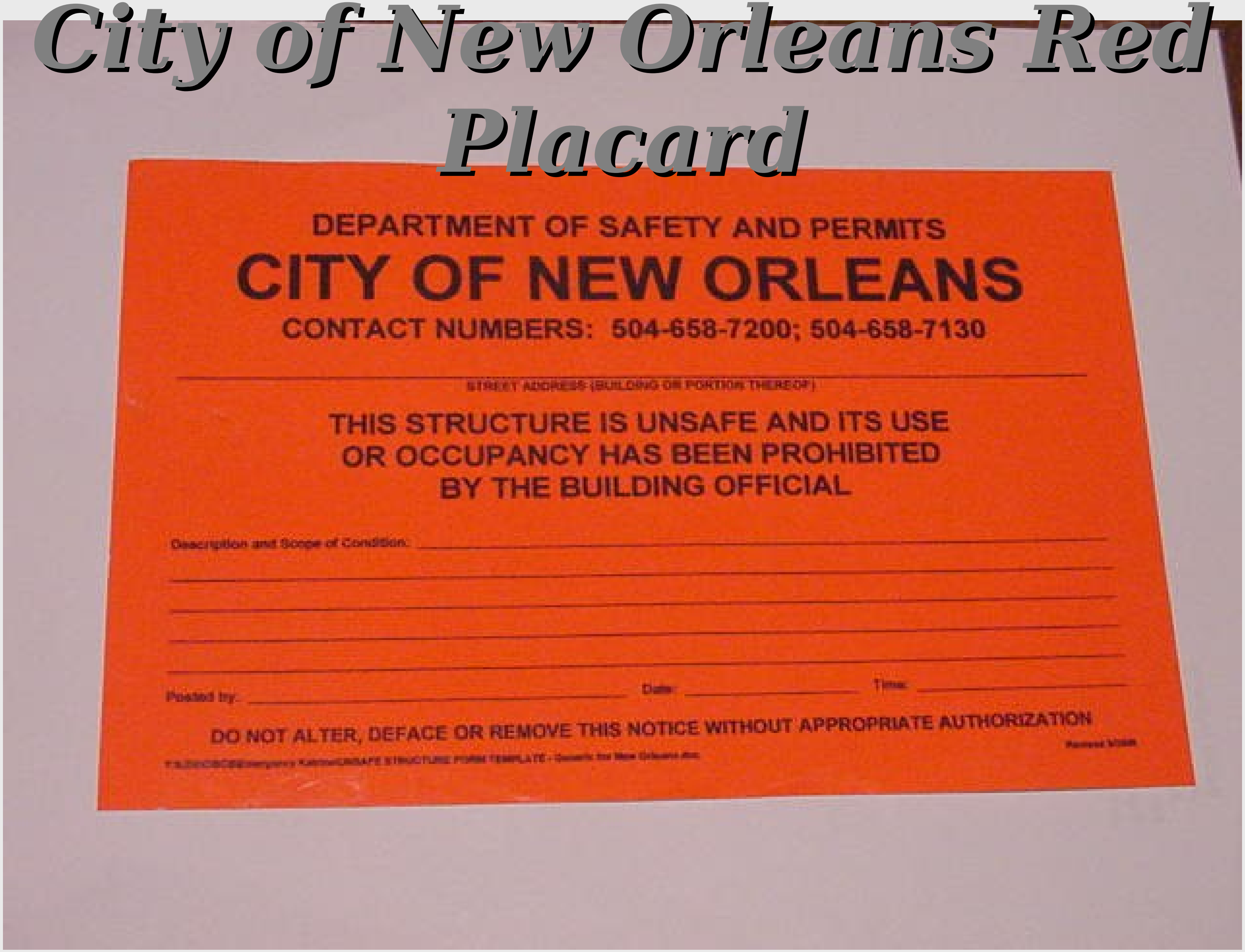
- *Place placard near main entrance to building in visible location*
- *Put placard in "dry" location if possible and ensure it is properly affixed*
- *If placard already posted and differs from your posting, notify team leader*

Labeling Structure Placards (cont'd)

Very Important: Include the following info on the placards:

- Street Address
- Brief description of major damage or significant hazards
- Printed name and signature of posting inspector
- Team number
- Date & time of posting

City of New Orleans Red Placard



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Description and Scope of Condition: ____________________

Posted by: __________ Date: __________ Time: __________

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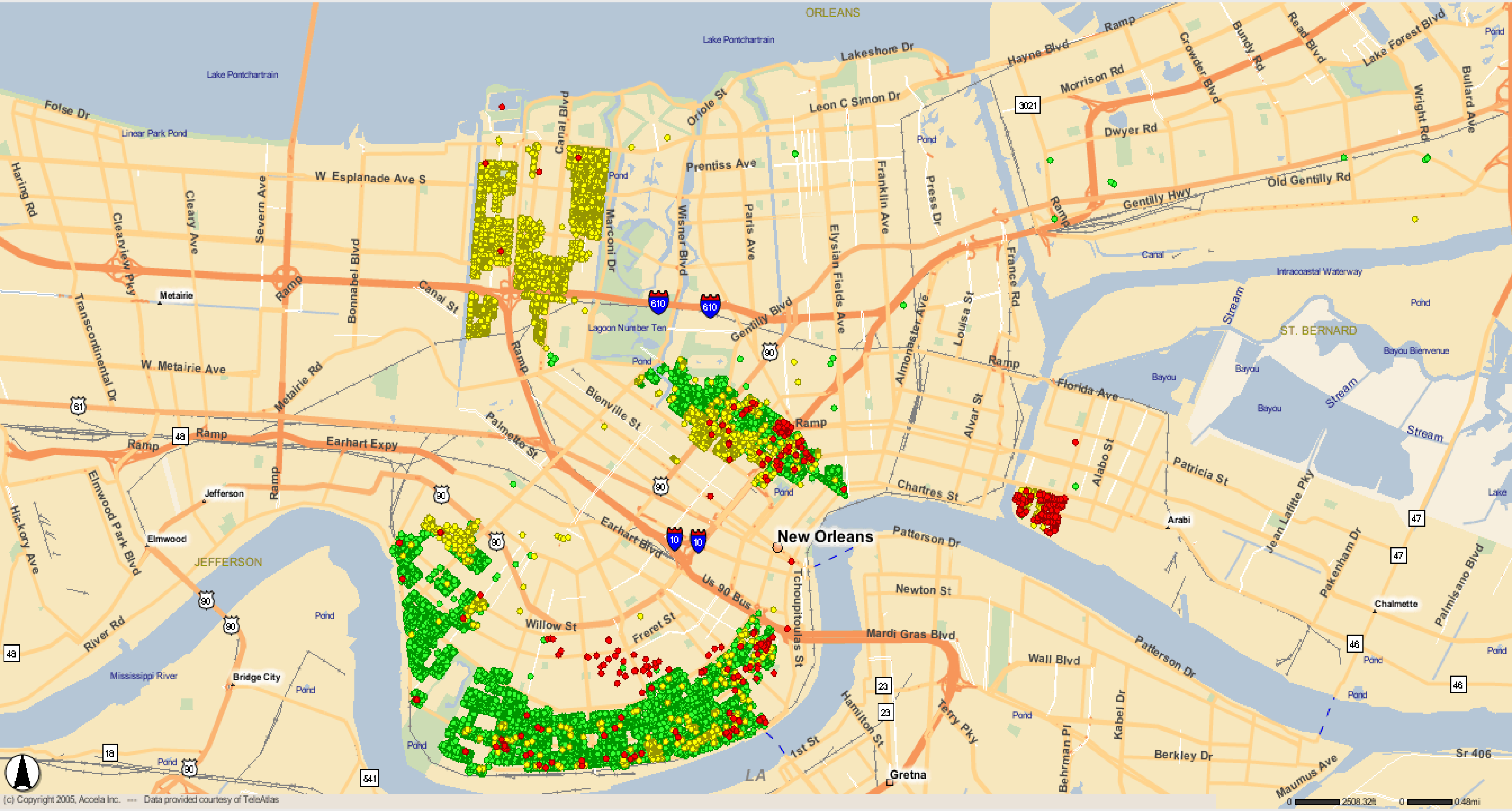
Results of SSA Inspections (as of 10/18/05)


ORLEANS
Lake Pontchartrain
Lake Pontchartrain
Linear Park Pond
Folse Dr
Lakeshore Dr
Hayne Blvd
Ramp
Morrison Rd
Crowder Blvd
Bundy Rd
Read Blvd
Lake Forest Blvd
Pond
Bullard Ave
Wright Rd
Leon C Simon Dr
3021
Dwyer Rd
Orleans St
Canal Blvd
W Esplanade Ave S
Prentiss Ave
Pond
Haring Rd
Clearview Pky
Cleary Ave
Severn Ave
Bonnabel Blvd
Marconi Dr
Wisner Blvd
Paris Ave
Elysian Fields Ave
Franklin Ave
Press Dr
Ramp
Gentilly Hwy
Old Gentilly Rd
Metairie
Ramp
Canal St
610
610
Gentilly Blvd
Almonaster Ave
Louisa St
France Rd
Canal
Intracoastal Waterway
Stream
Pond
ST. BERNARD
Bayou Bienvenue
Lagoon Number Ten
Transcontinental Dr
W Metairie Ave
Metairie Rd
Pond
Ramp
Bienville St
90
Ramp
Florida Ave
Bayou
Bayou
Bayou
Stream
Stream
61
48
Ramp
Ramp
Earhart Expy
Palmetto St
Alvar St
Chartres St
Alabo St
Patricia St
Jean Lafitte Pky
Lake
Jefferson
Ramp
90
90
Pond
Arabi
47
Hickory Ave
Elmwood Park Blvd
Elmwood
JEFFERSON
90
Earhart Blvd
10
10
New Orleans
Patterson Dr
47
Pakenham Dr
Chalmette
Palmisano Blvd
90
90
River Rd
Pond
Us 90 Bus
Tchoupitoulas St
Newton St
Willow St
Freret St
Mardi Gras Blvd
Wall Blvd
46
Pond
Patterson Dr
Pond
48
Mississippi River
Bridge City
Pond
23
23
Hamilton St
Terry Pky
Kabel Dr
Pond
46
Pond
Pond
18
Pond
90
541
LA
1st St
Gretna
Behrman Pl
Berkley Dr
Maumus Ave
Sr 406
0 2508.32ft 0 0.48mi

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4. Damage due to Wind and Flood Loads

Detailed Evaluation of Wind Damaged Buildings

Building Categories

- *Low-Rise Residential Buildings*
- *Low-Rise Commercial Buildings*
- *Mid-Rise and High-Rise Buildings*

Low-Rise Residential Buildings

Low-Rise Residential Buildings

- *Examples*
  - Single-family homes
  - Duplexes
  - Mobile housing
  - Apartments buildings
  - Condominiums
- *Configuration*
  - Variety of plan configurations
  - One to four stories

Low-Rise Residential Buildings

- *Typical Construction*
  - Masonry or wood or light metal framing

- *Exterior Architectural Treatment*
  - Masonry or stucco veneer
  - Wood, metal, or vinyl siding

- *Note: Some walls are solid brick, others are wood framing with brick veneer*

Low-Rise Residential Buildings

- *Typical wind damage*
  - Gable end-wall failure
  - Failed or damaged roof-to-wall connection
  - Failed or damaged wall-to-floor connection
  - Veneer separation from structure
  - Rafter separation at peak of roof

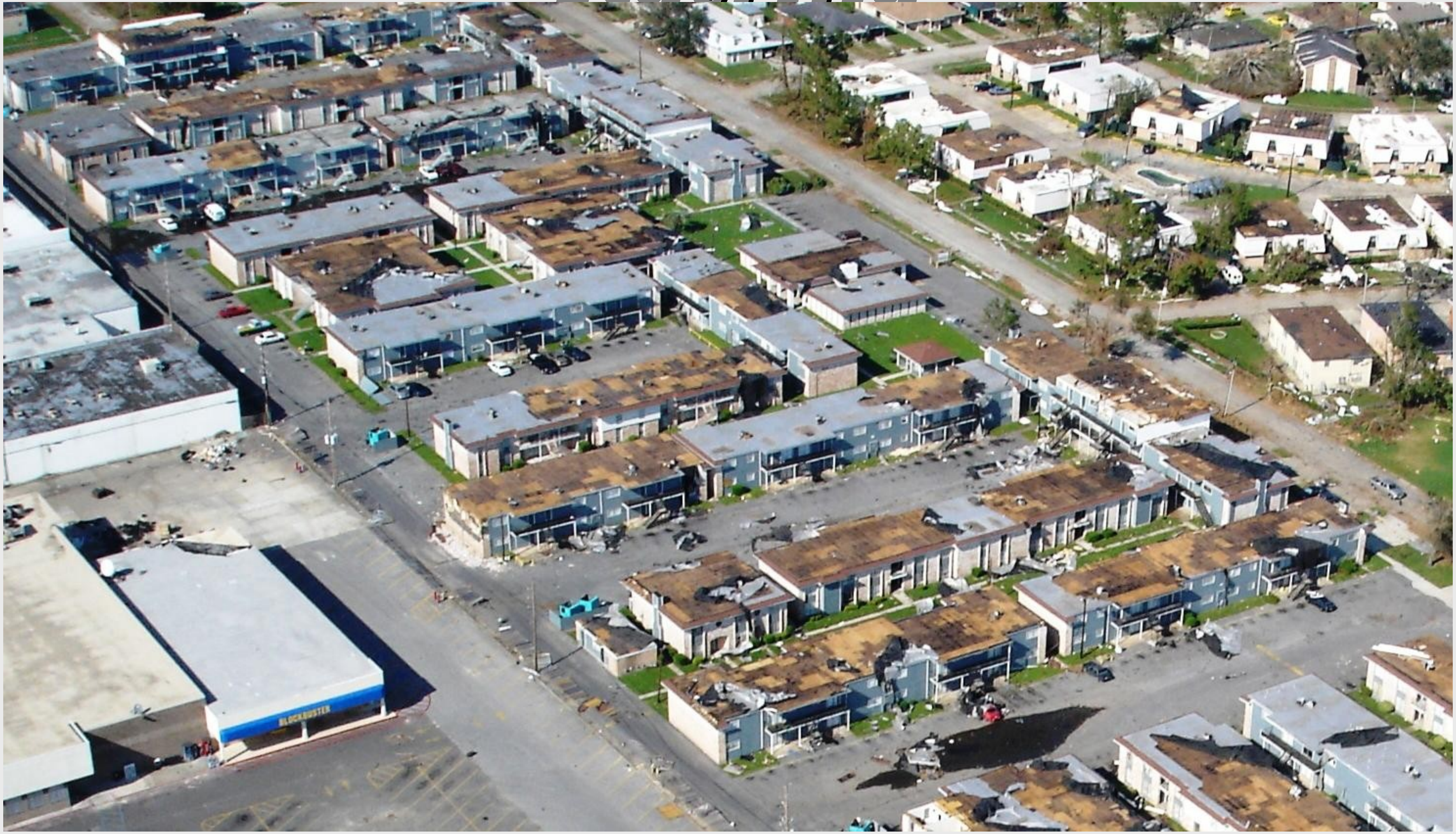
Low-Rise Residential Buildings

- *Typical wind damage (cont’d)*
  - Roofing damage
  - Water damage to insulation and gypsum board ceilings (from rain)
  - Window and door failure/damage
  - Damage to interior partitions receiving wind loads

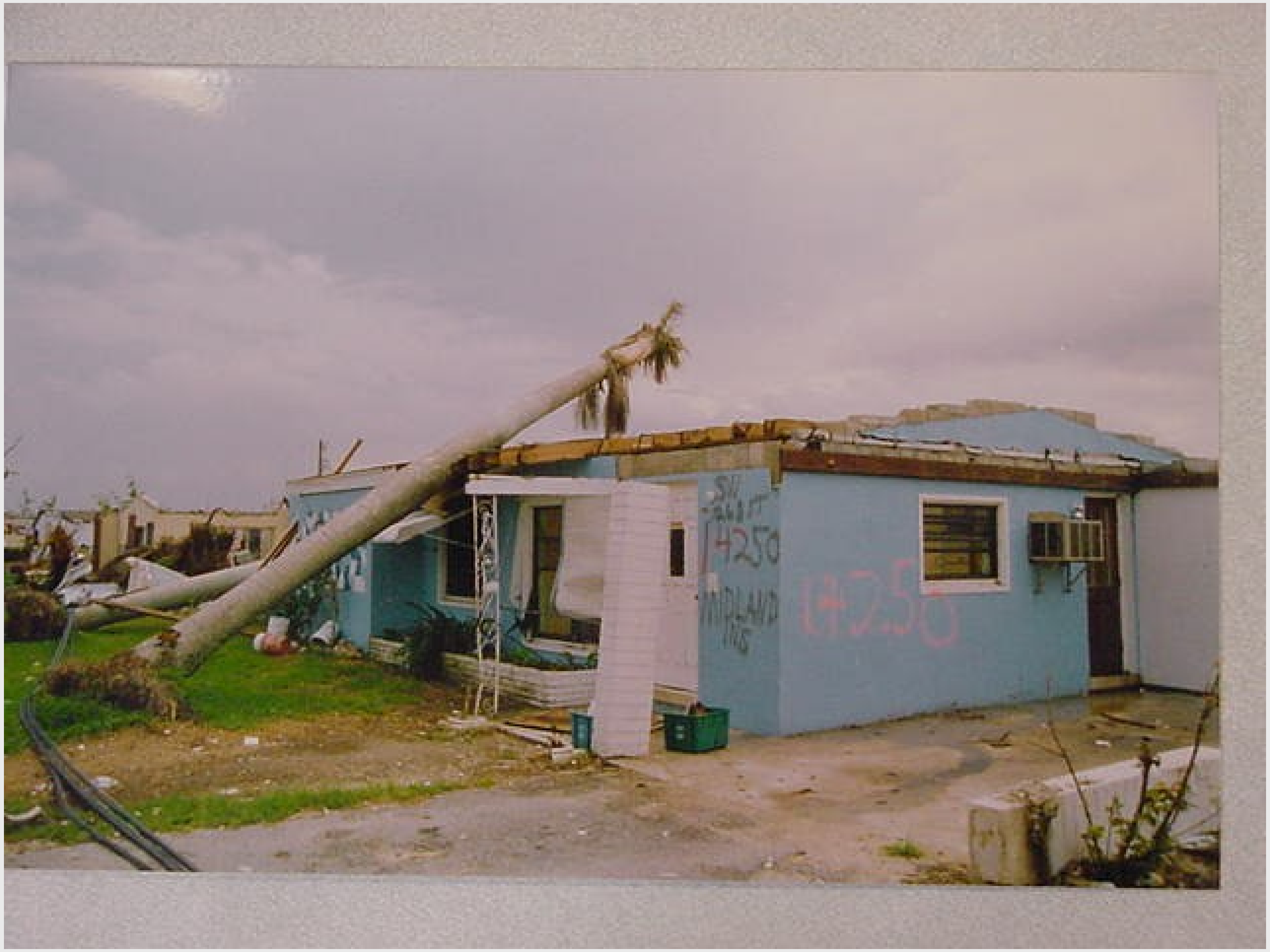
Low-Rise Residential Buildings

- *Typical wind damage (cont’d)*
  - Damaged structural members
  - Displacement of structure from foundation
  - Damaged porches or carports
  - Chimney falling risk

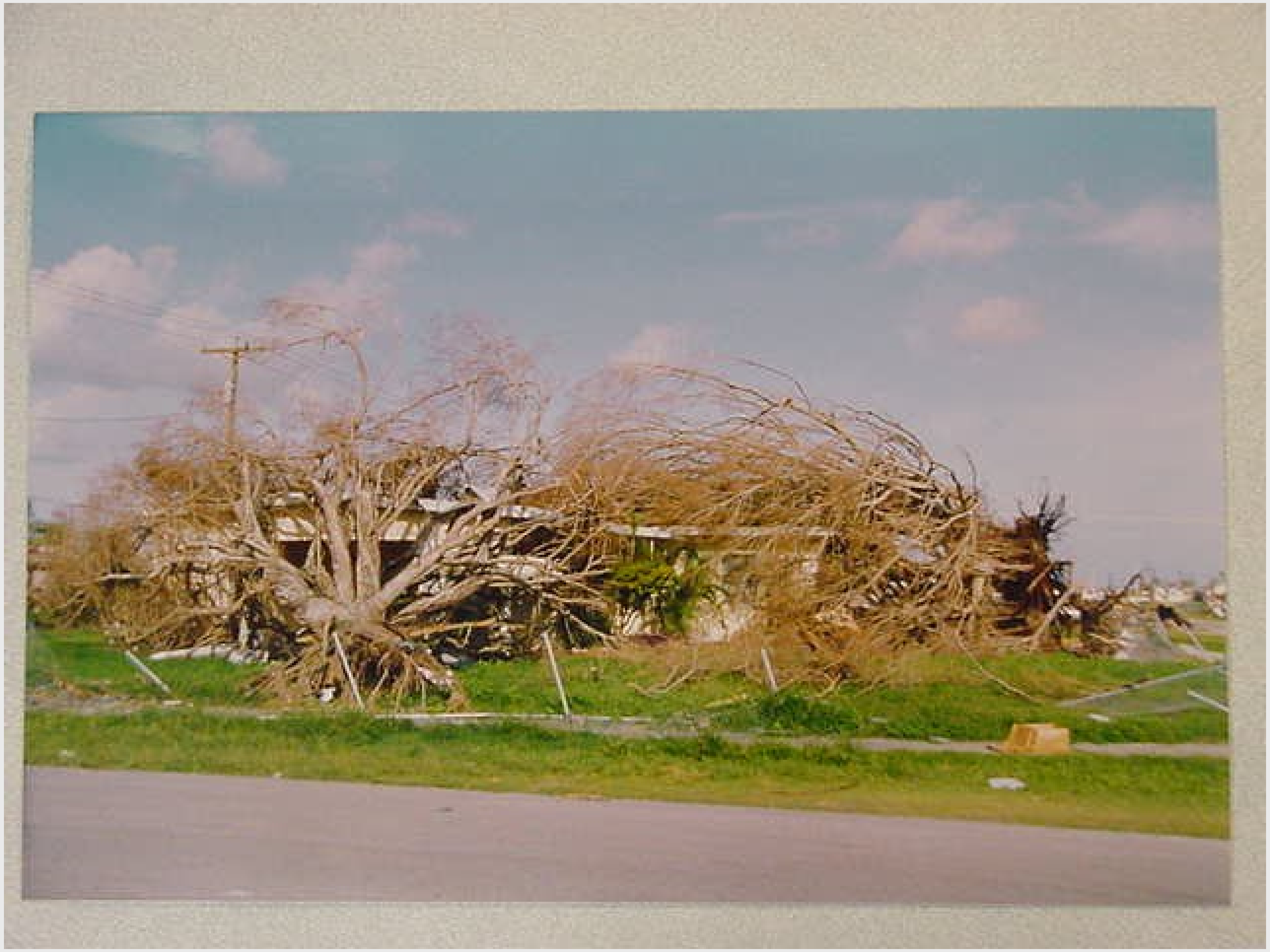
Sample Wind Damage Photos - Katrina


BLOCKBUSTER

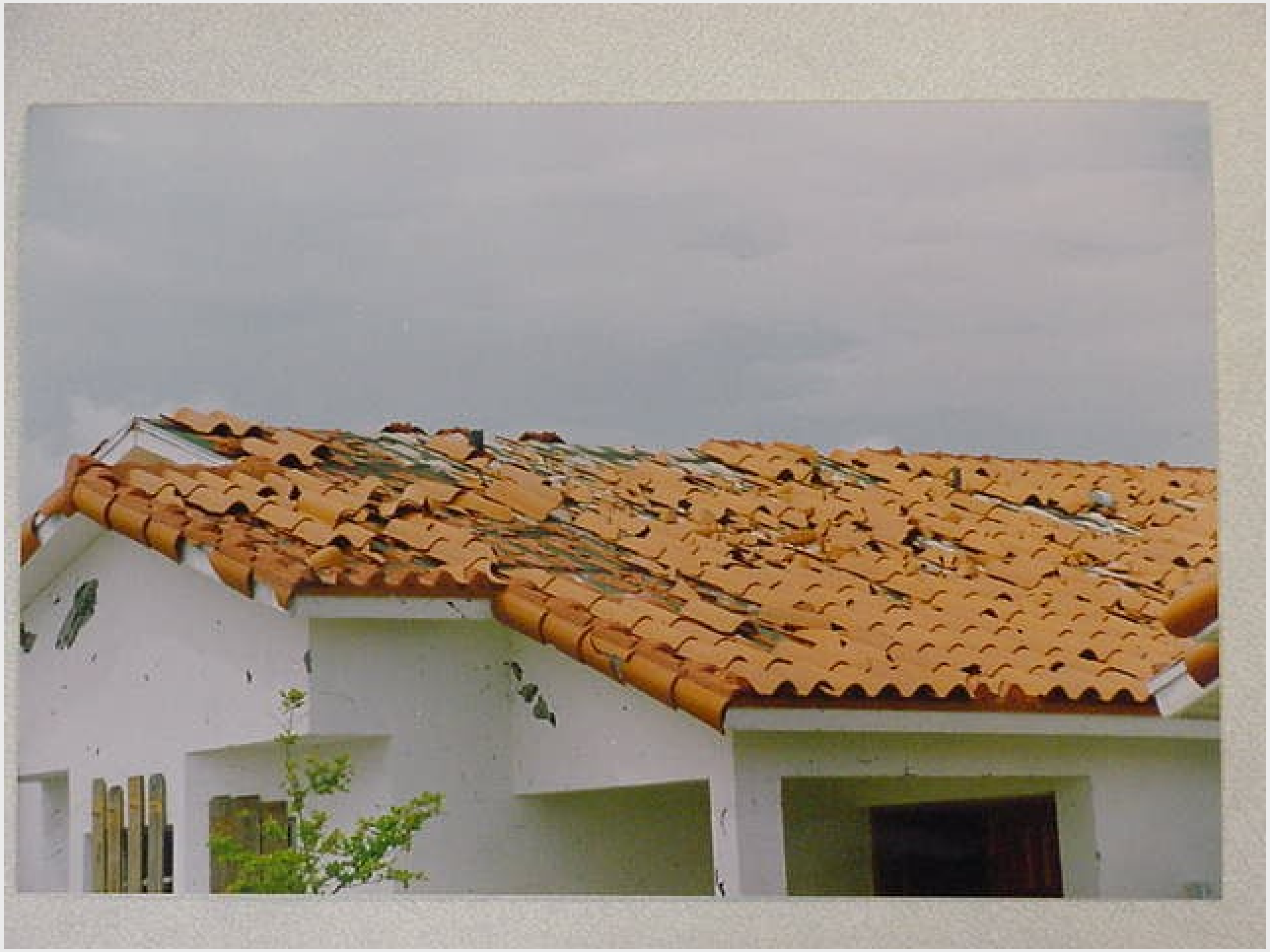
Sample Wind Damage Photos (Yellow)


SW
14250
INS

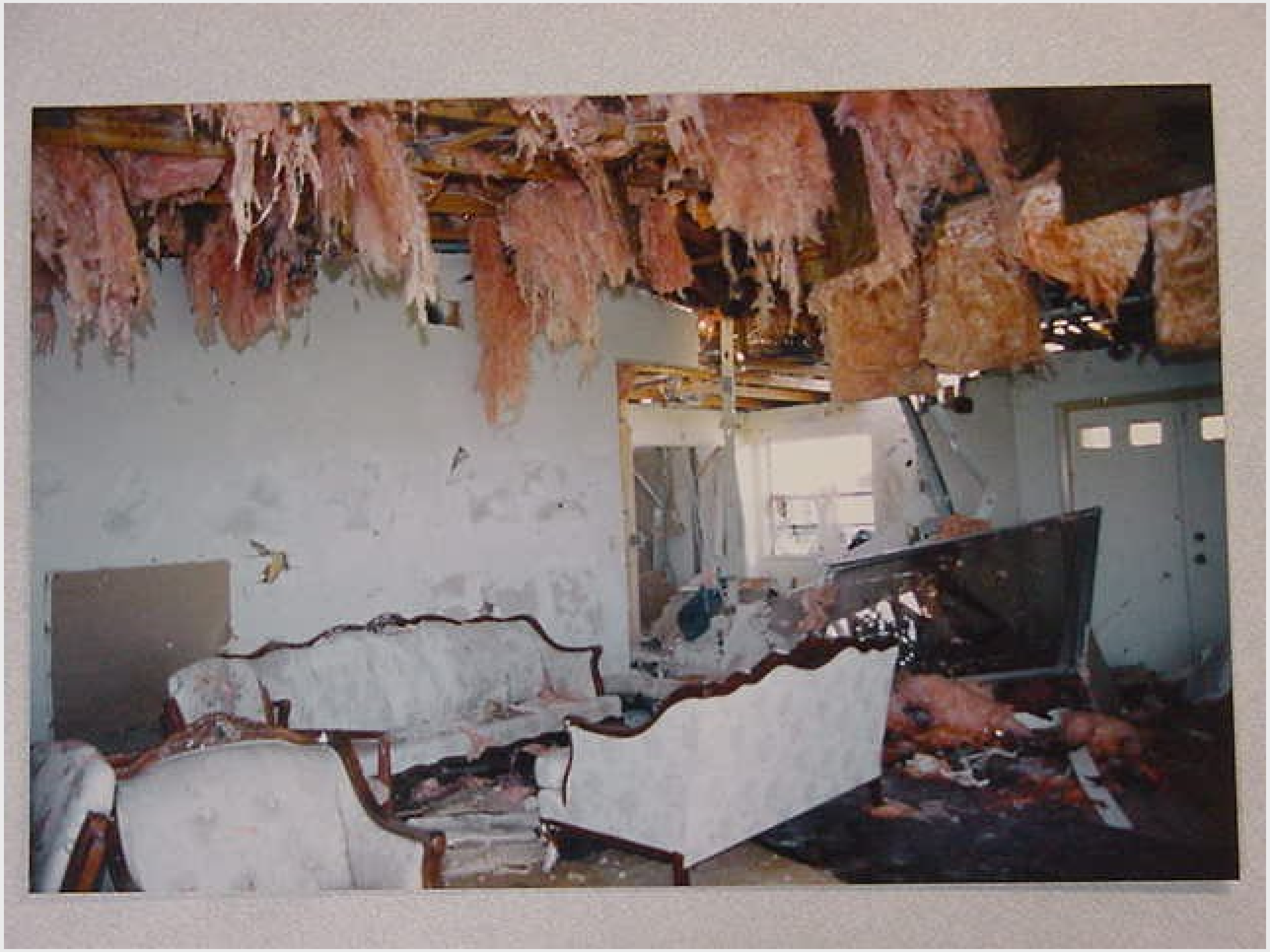
Sample Wind Damage Photos (Red)



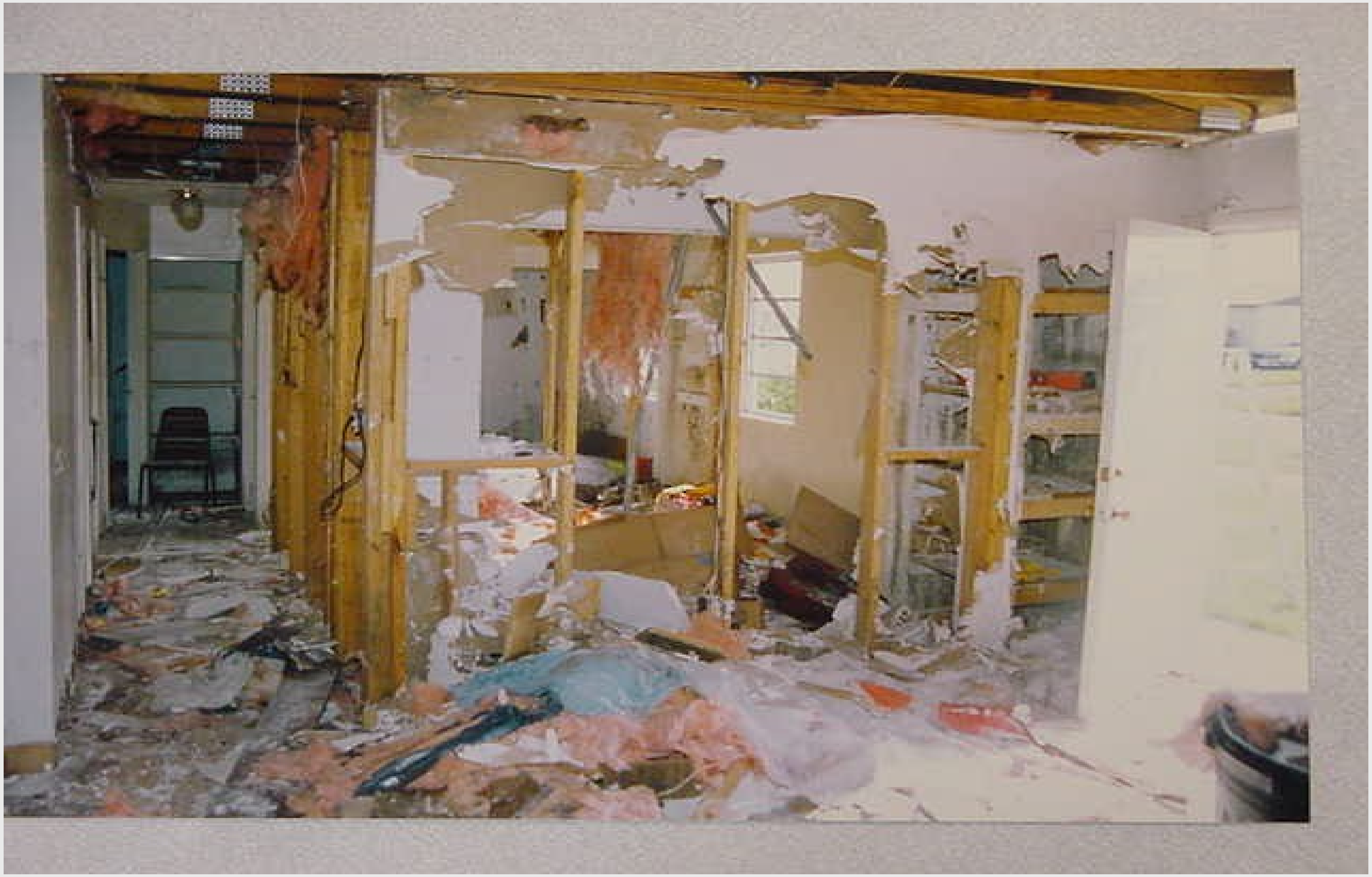
Sample Wind Damage Photos (Yellow)



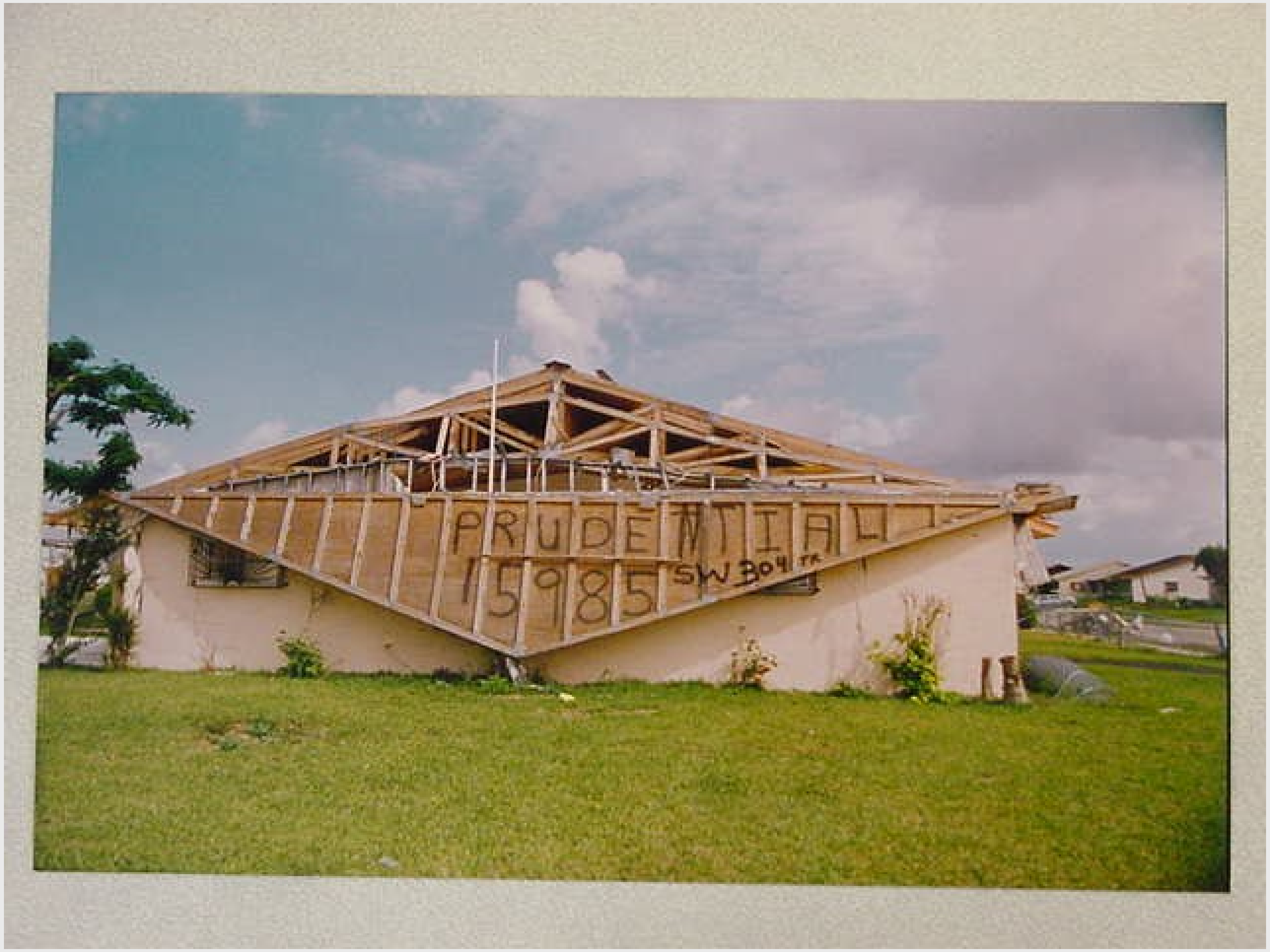
Sample Wind Damage Photos (Yellow)



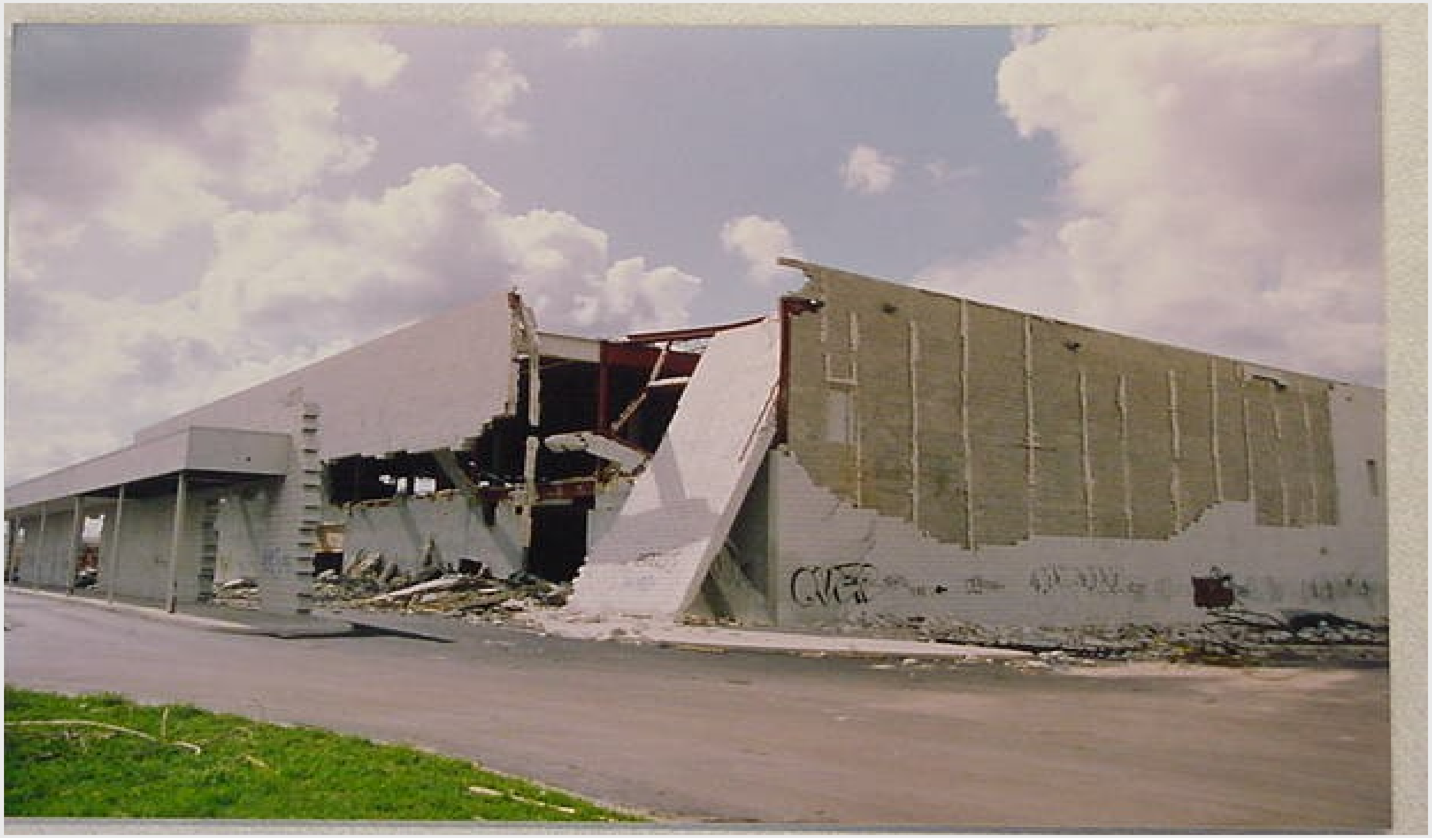
Sample Wind Damage Photos (Yellow)



Sample Wind Damage Photos (Yellow)


PRUDENTIAL
15985 SW 304 TR

Sample Wind Damage Photos (Red)



Detailed Evaluation of Flood-Damaged Buildings

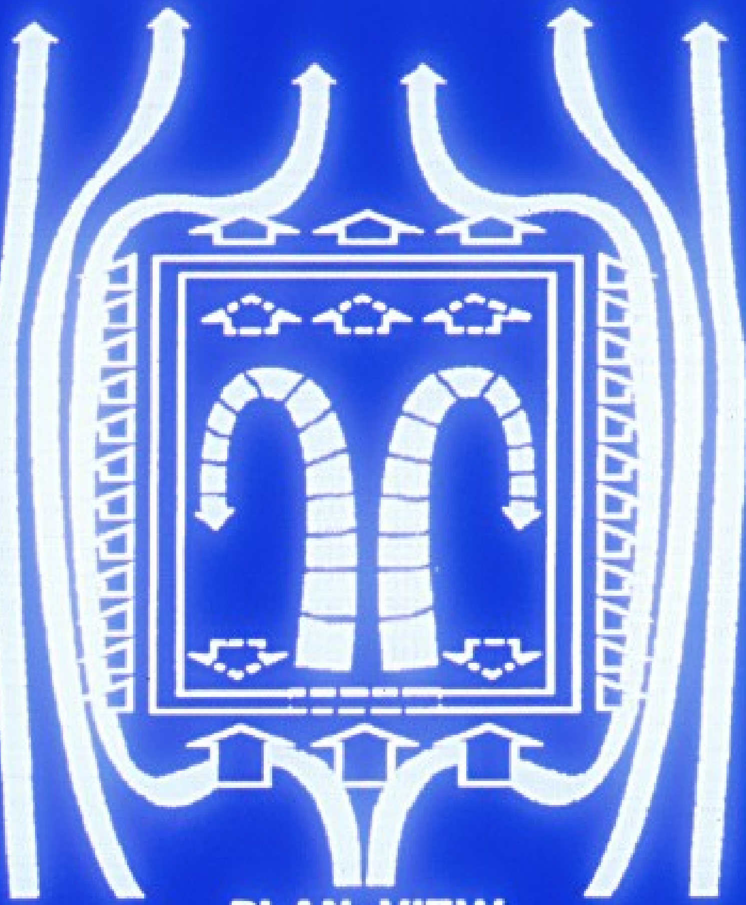
Flood Damage Evaluation

- *Building characteristics to consider:*
  - Building location
  - Building age (newer buildings are to code)
  - Lowest floor elevation
  - Foundation type
  - Building materials below flood level

Typical Building Damage

- *Nature and extent of damage depends on:*
  - Type, severity; and duration of flooding
  - Type of supporting soil and its resistance to saturation, moving water, and erosion
  - Structure characteristics

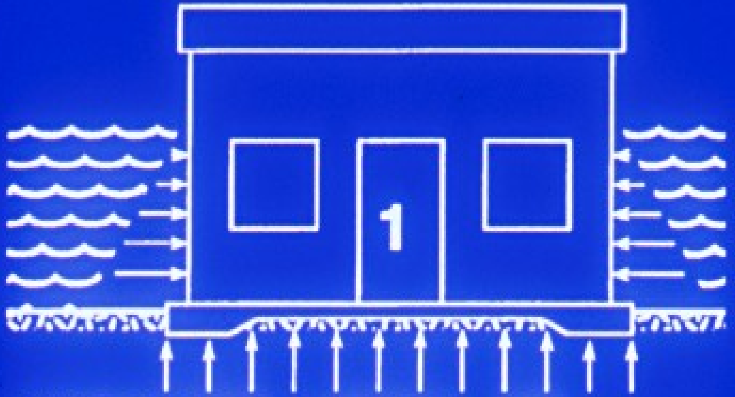
BASIC LOADING PATTERNS • FLOOD



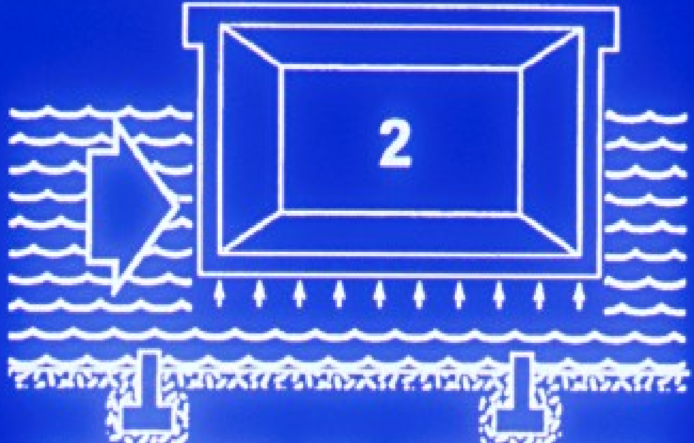
PLAN VIEW

HYDRODYNAMIC FORCES INCLUDE THE IMPACT OF WATER & WAVES ON THE UPSTREAM SIDE, DRAG FORCES ON SIDES, & SUCTION PRESSURE ON TO DOWNSTREAM SIDE. WHEN WATER RUSHES INTO A STRUCTURE (shown dashed) IT IMPACTS THE FACING WALL AND THEN TURNS BACK TOWARDS ITS POINT OF ORIGIN, CAUSING HYDRODYNAMIC FORCES ON INTERIOR ELEMENTS.

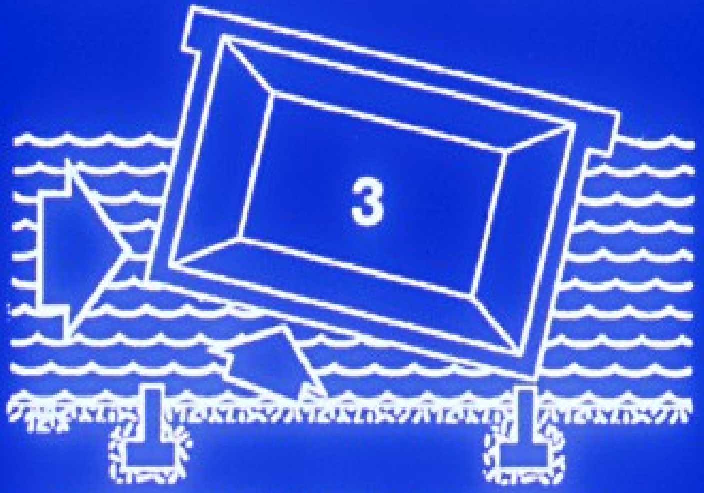
BASIC LOADING PATTERNS • FLOOD



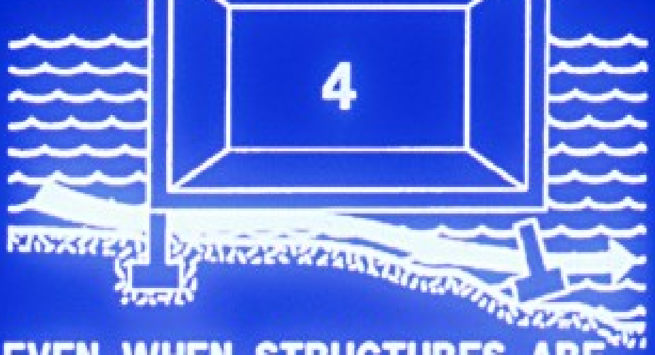
HYDROSTATIC LATERAL AND UPLIFT PRESSURES PERPENDICULAR TO ALL SURFACES OF EMPTY BLDG



TRANSLATION MAY RESULT FROM COMBINATION OF BUOYANCY AND HYDRODYNAMIC FORCES



OVERTURNING MAY OCCUR IF FRICTION, CONNECTIONS, UNEVEN WATER INFILTRATION HOLDS ONE EDGE OF BLDG TO FOUNDATION



EVEN WHEN STRUCTURES ARE NOT MOVED, RUSHING WATER CAN CAUSE SCOUR & EROSION AROUND SLABS & FOUNDATIONS

Damage Due to Inundation and Hydrostatic forces

- *Flood waters that rise slowly can cause three types of damage:*
  - Damage due to material degradation or contamination
  - Damage due to lateral hydrostatic forces
  - Damage due to vertical buoyant forces (uplift)

Damage due to Hydrodynamic Forces

- *Flowing water can exert large lateral forces on buildings and foundations extending below the flood level causing failure*
- *Water flowing at high velocities may also carry debris into buildings*

Damage due to Erosion and Scour

- *Buildings on shallow foundations are most affected by water erosion and scour; inspect all sides of the foundation thoroughly!*

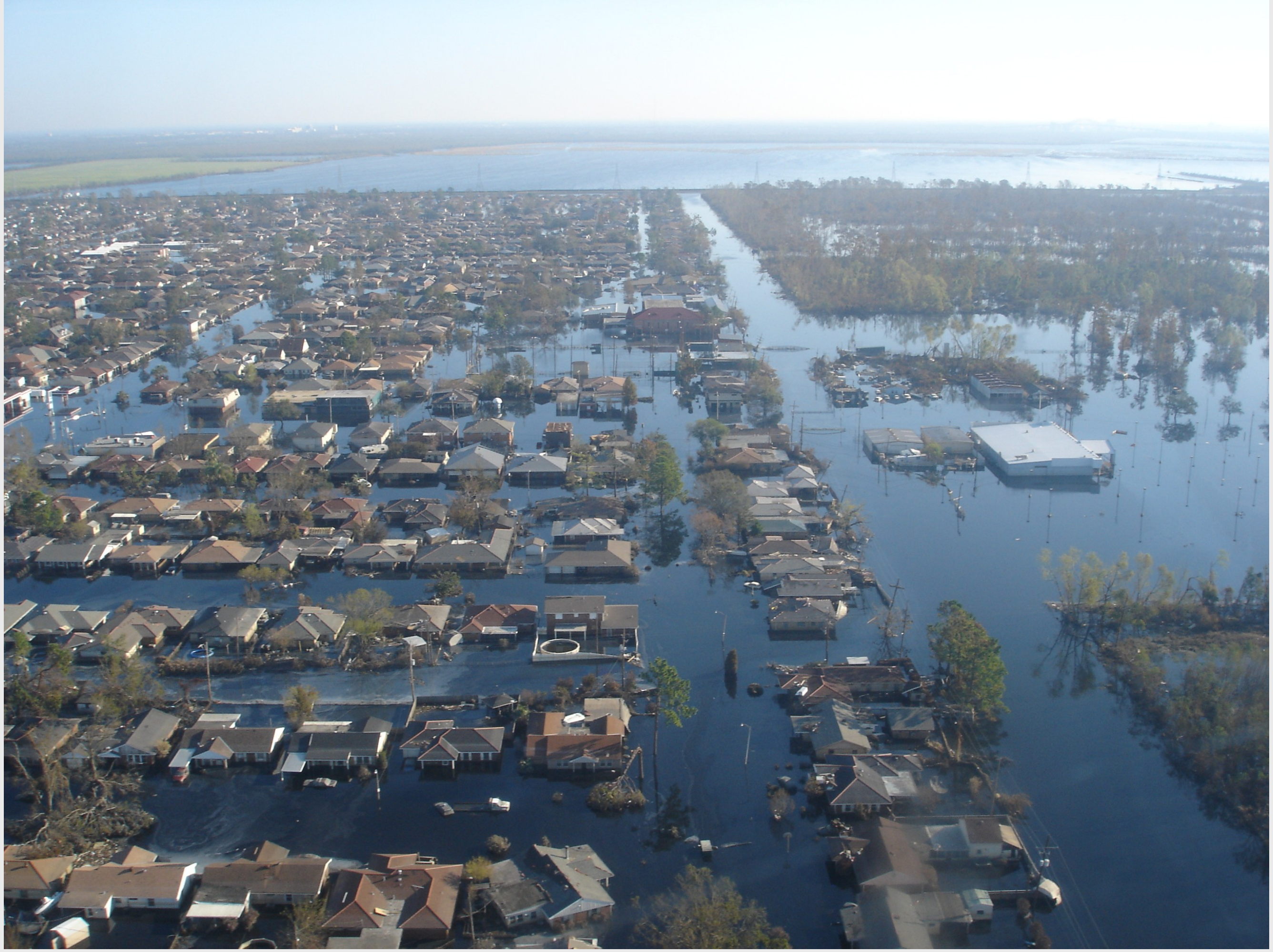
Damage due to Geological Conditions

- *Sedimentation: Sediment deposited inside or outside a structure may pose a risk to the structural integrity of the building and may lead to failure*

- *Building unsafe If more than 1’ to 2’ of sedimentation inside or out*

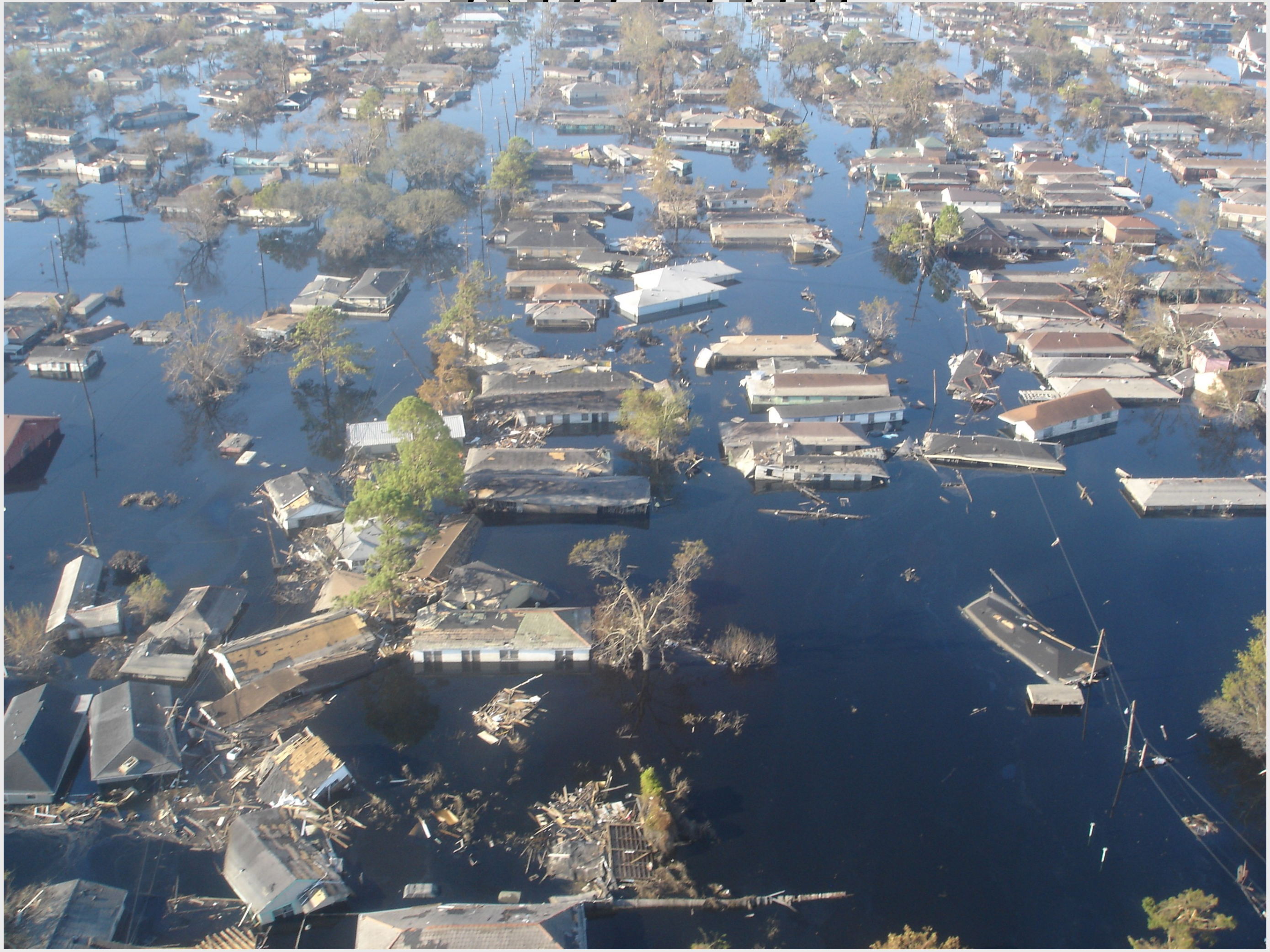
Sample Water Damage Photos - Katrina

Sample Water Damage Photos - Katrina



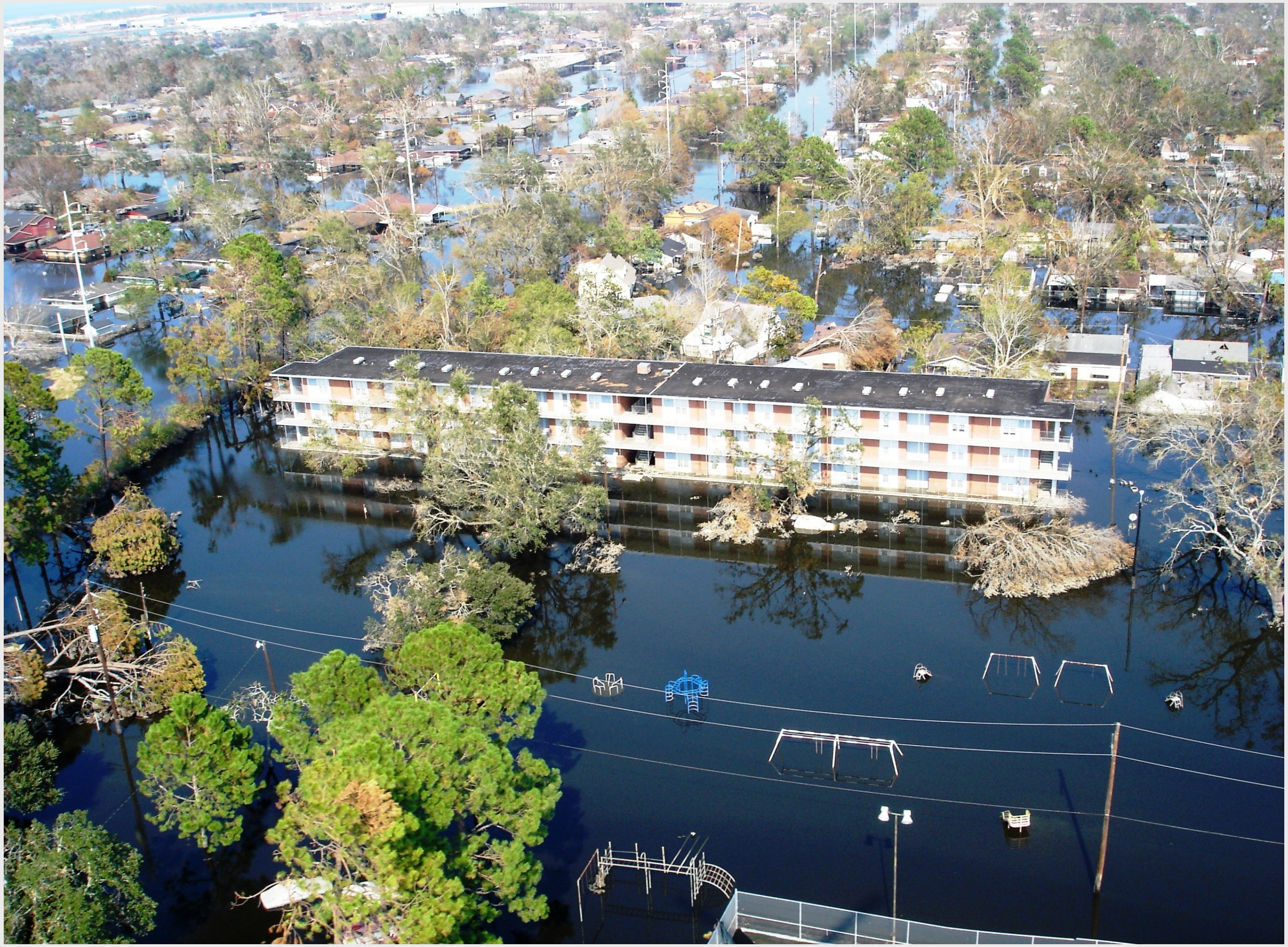
Sample Water Damage Photos - Katrina

Sample Water Damage Photos - Katrina

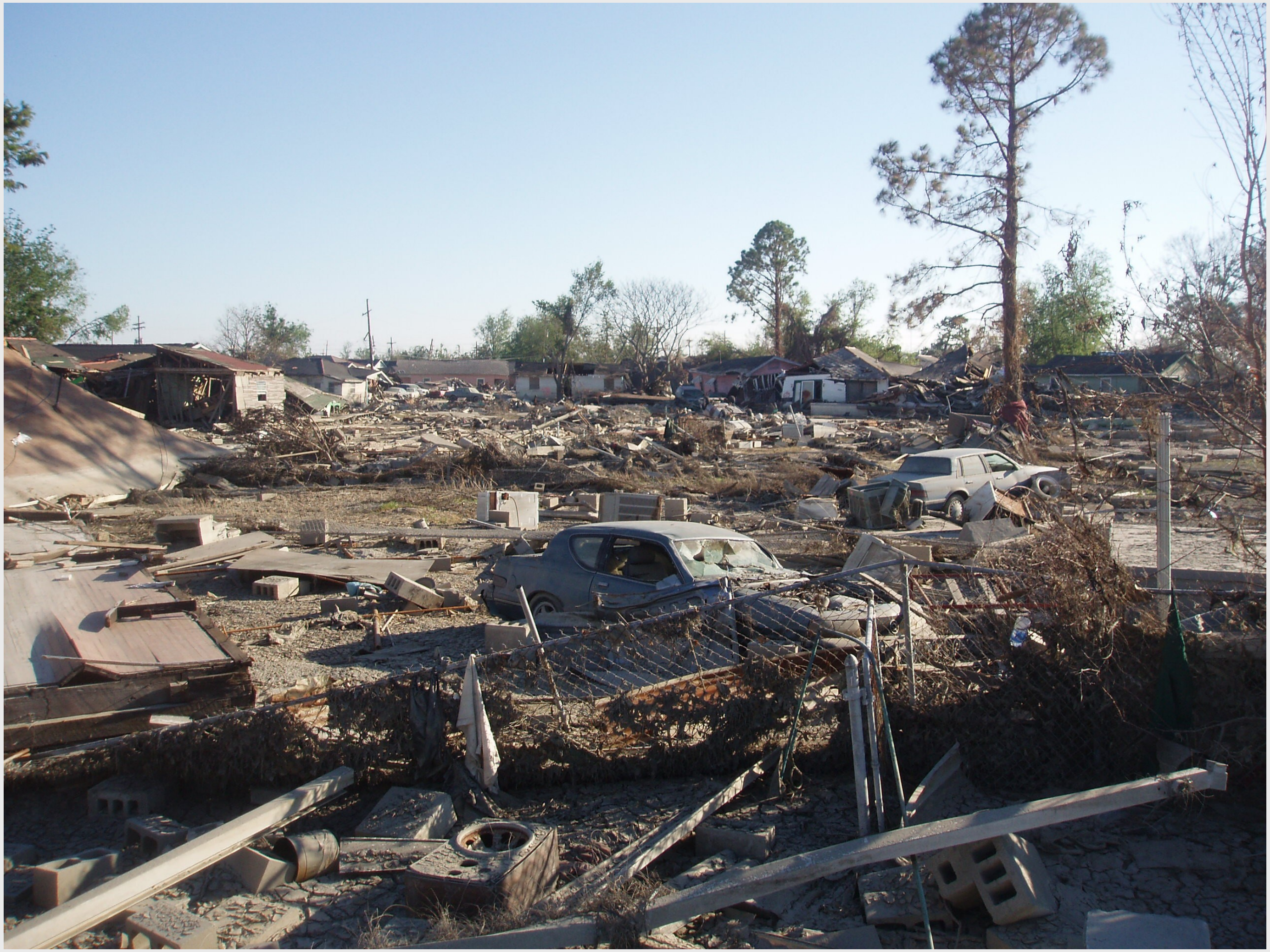


Sample Water Damage Photos - Katrina

Sample Water Damage Photos - Katrina

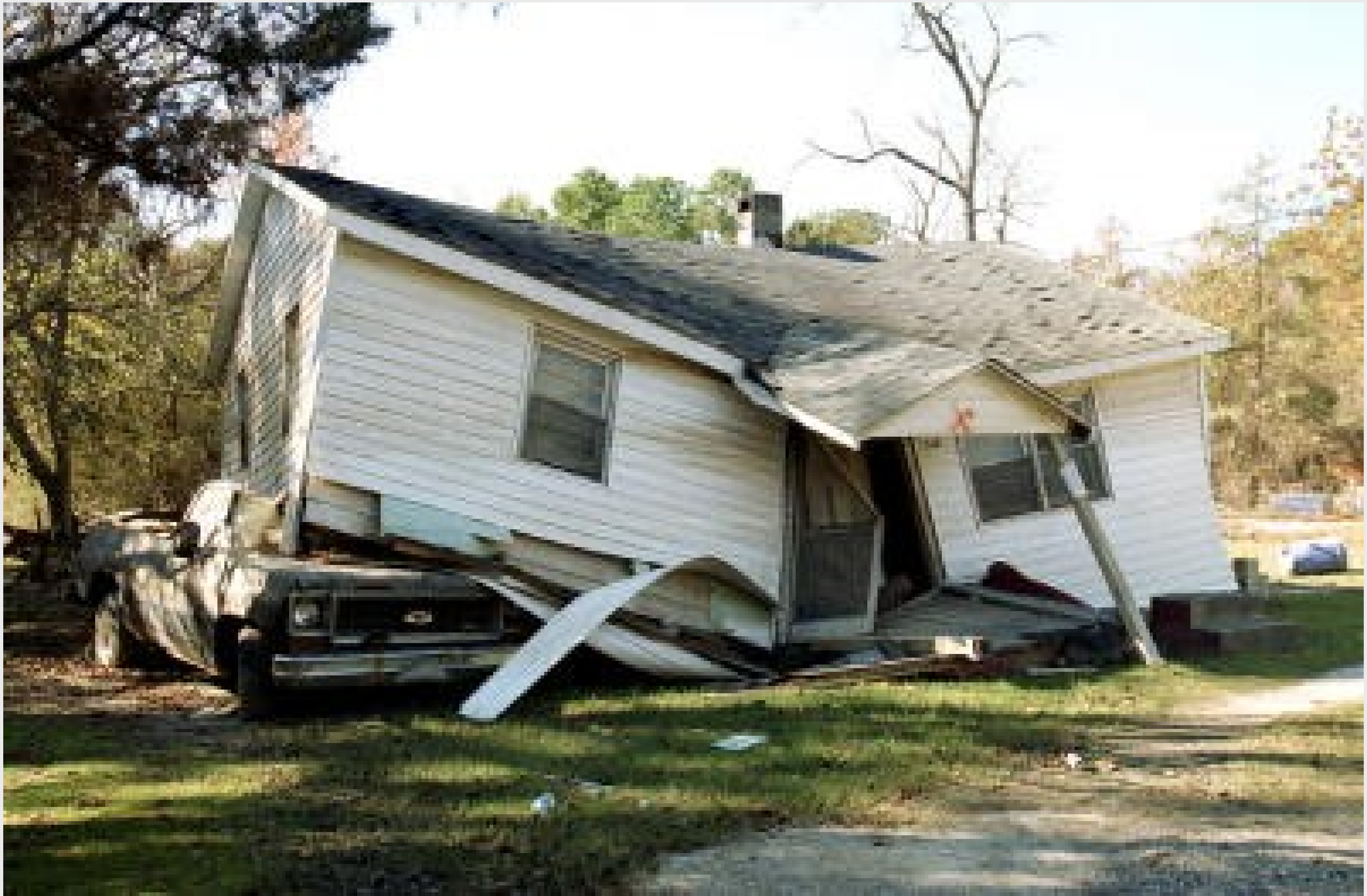


Sample Water Damage Photos - Katrina



Sample Water Damage Photos - Katrina

Sample Water Damage Photos – WVA Flooding



5. Building Evaluation Procedures

Rapid Evaluation Procedure

Rapid Evaluation

- When personnel is limited, use to quickly inspect and evaluate buildings

- Exterior inspection only; interior viewed only from window or open door

Rapid Evaluation Considerations

- *Most of the building damages in New Orleans are due to static water inundation*

- *Damages also caused by wind and rapidly flowing water - but to lesser extent*

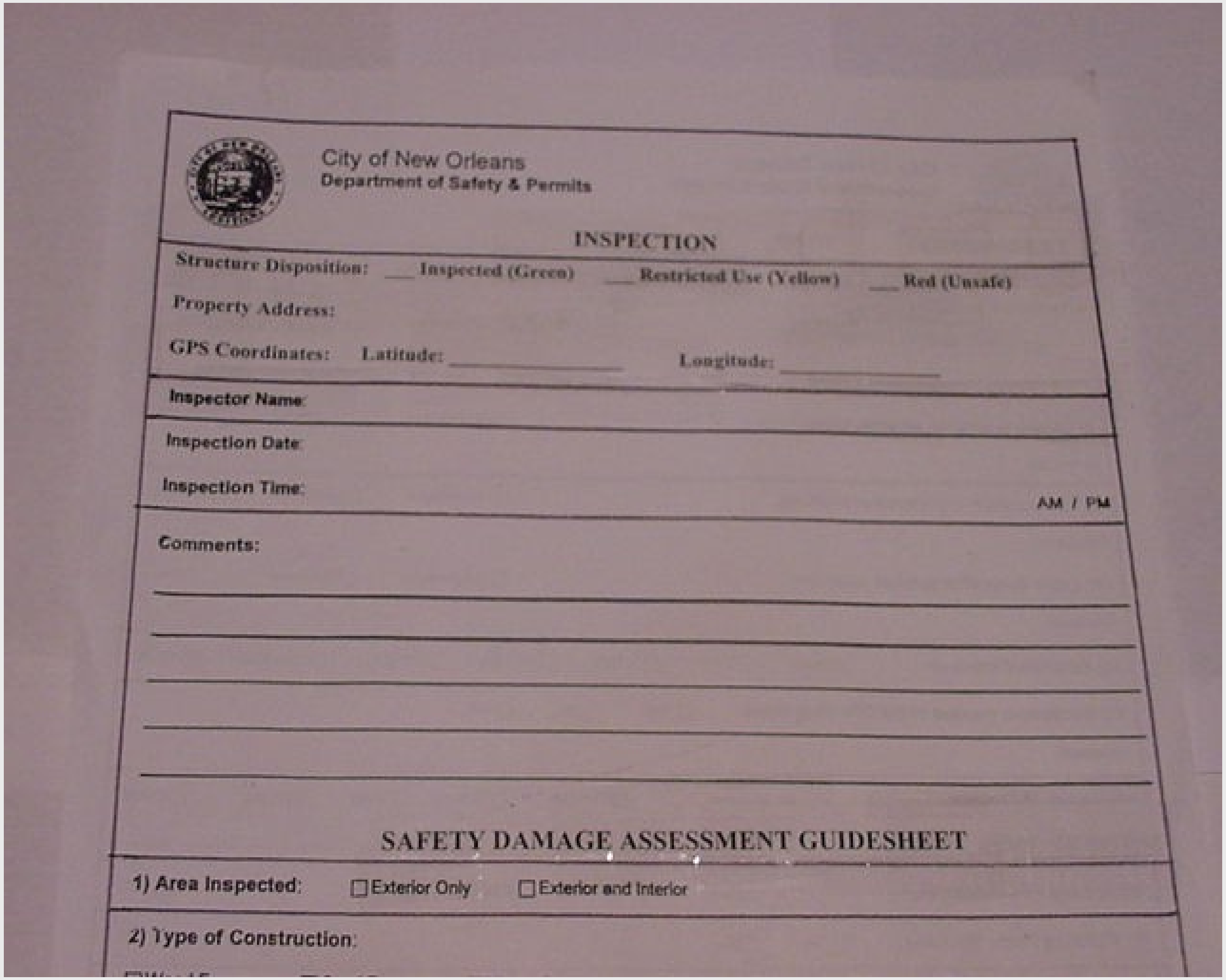
Rapid Evaluation Considerations

- *SSA Inspectors will use Accela software installed on laptop computers – data entered in field (goal is to do with no paperwork)*

- *Photographs will not be required*

"Tough Book" Laptop with Accela Program

Inspection Form (General Info)



City of New Orleans
Department of Safety & Permits

INSPECTION

Structure Disposition: ___ Inspected (Green) ___ Restricted Use (Yellow) ___ Red (Unsafe)

Property Address:

GPS Coordinates: Latitude: ______________ Longitude: ______________

Inspector Name:

Inspection Date:

Inspection Time: AM / PM

Comments:

SAFETY DAMAGE ASSESSMENT GUIDESHEET

1) Area Inspected: ☐ Exterior Only ☐ Exterior and Interior

2) Type of Construction:

Inspection Form (General Info) – (Cont’d)

1. *Address: #, Street, City, Zip*
2. *GPS Coordinates: Lat., Long.; decimal degrees*
3. *Category/Inspection Type: “Serv Request/Investigation”*
4. *Inspector: Team # auto. entered*
5. *Date/Time: Automatically entered*
6. *Tracking: N/A*

Inspection Form (General Info) – (Cont'd)

7. *Scheduling Comments: N/A*
8. *Disposition: Very important! This is the building posting (green, yellow, red)*
9. *Contractor Sign Off : N/A*
10. *Inspector Sign Off: N/A*

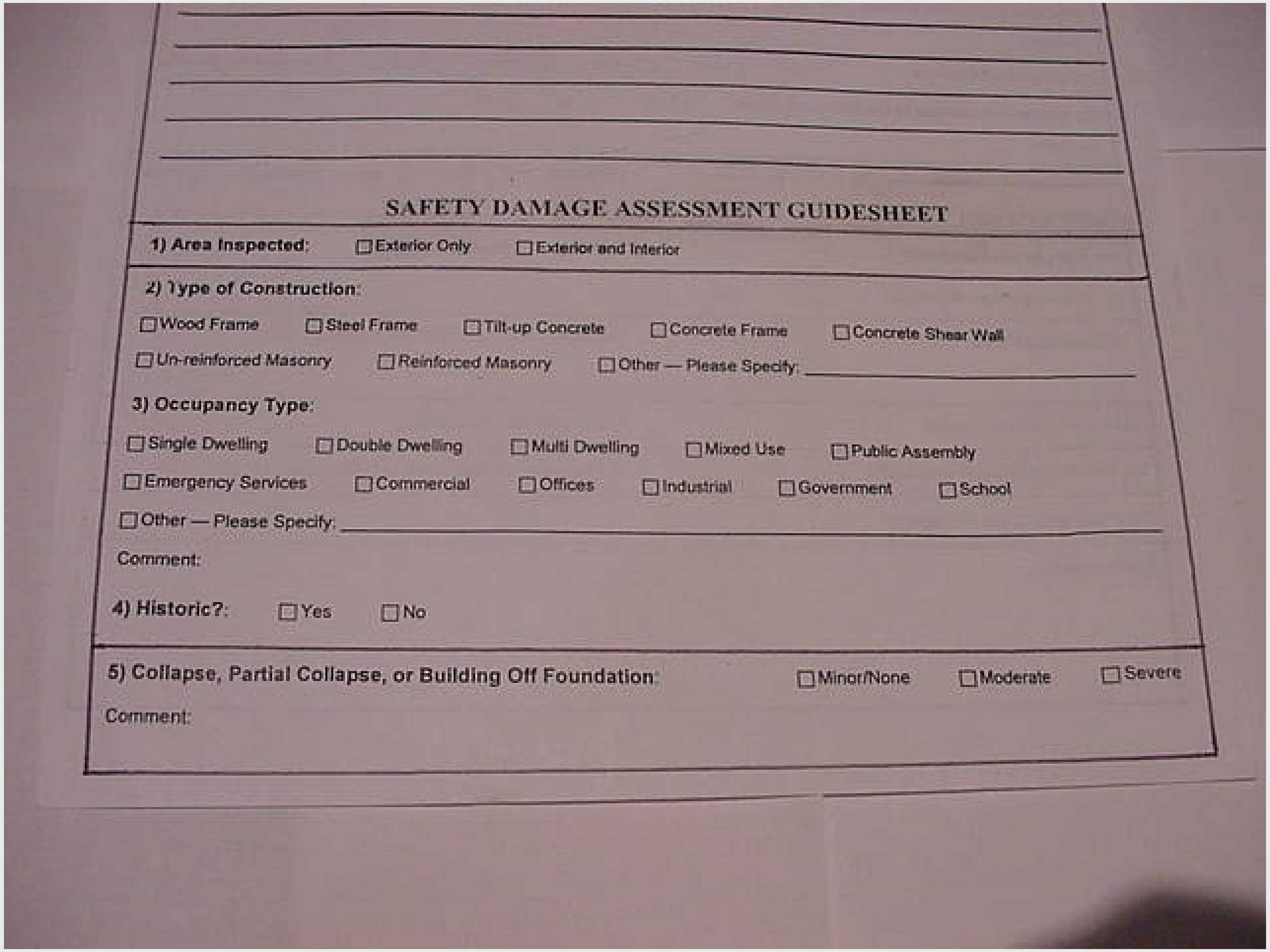
Inspection Form (General Info) – (Cont'd)

11. Comments: Very important! Indicate "Flooding 'X' feet above first floor"

Round to nearest foot (for 0 to 6 and 0 to -6 inches, use 0.5 feet)

12. Standard Comments: N/A

Safety Damage Assessment Guidesheet



SAFETY DAMAGE ASSESSMENT GUIDESHEET

1) Area Inspected: ☐ Exterior Only ☐ Exterior and Interior

2) Type of Construction:

☐ Wood Frame ☐ Steel Frame ☐ Tilt-up Concrete ☐ Concrete Frame ☐ Concrete Shear Wall

☐ Un-reinforced Masonry ☐ Reinforced Masonry ☐ Other — Please Specify: ____________

3) Occupancy Type:

☐ Single Dwelling ☐ Double Dwelling ☐ Multi Dwelling ☐ Mixed Use ☐ Public Assembly

☐ Emergency Services ☐ Commercial ☐ Offices ☐ Industrial ☐ Government ☐ School

☐ Other — Please Specify: ____________

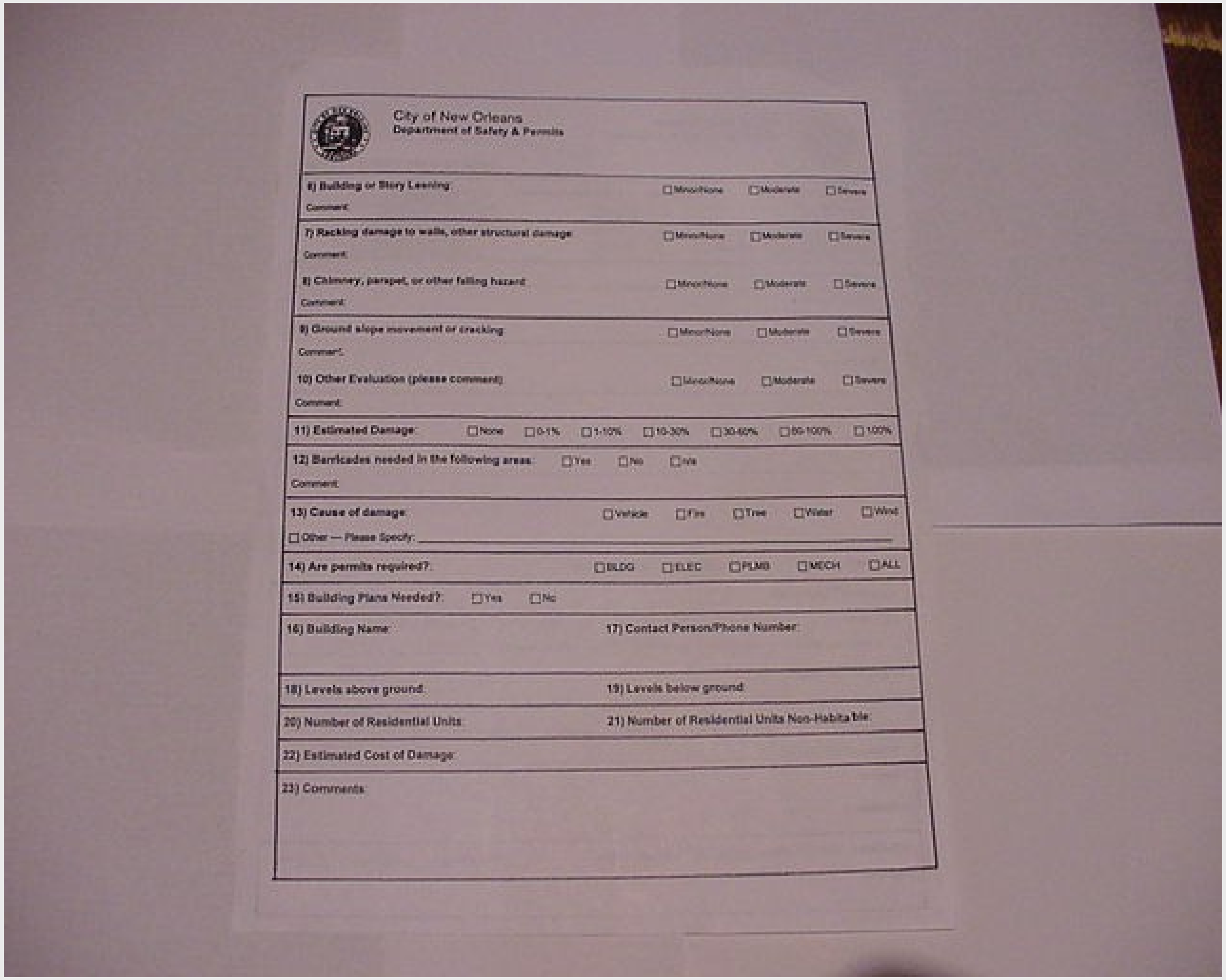
Comment:

4) Historic?: ☐ Yes ☐ No

5) Collapse, Partial Collapse, or Building Off Foundation: ☐ Minor/None ☐ Moderate ☐ Severe

Comment:

Safety Damage Assessment Guidesheet (Cont’d)



City of New Orleans
Department of Safety & Permits

6) Building or Story Leaning: ☐ Minor/None ☐ Moderate ☐ Severe
Comment:

7) Racking damage to walls, other structural damage: ☐ Minor/None ☐ Moderate ☐ Severe
Comment:

8) Chimney, parapet, or other falling hazard: ☐ Minor/None ☐ Moderate ☐ Severe
Comment:

9) Ground slope movement or cracking: ☐ Minor/None ☐ Moderate ☐ Severe
Comment:

10) Other Evaluation (please comment): ☐ Minor/None ☐ Moderate ☐ Severe
Comment:

11) Estimated Damage: ☐ None ☐ 0-1% ☐ 1-10% ☐ 10-30% ☐ 30-60% ☐ 60-100% ☐ 100%

12) Barricades needed in the following areas: ☐ Yes ☐ No ☐ n/a
Comment:

13) Cause of damage: ☐ Vehicle ☐ Fire ☐ Tree ☐ Water ☐ Wind
☐ Other — Please Specify: ______

14) Are permits required?: ☐ BLDG ☐ ELEC ☐ PLMB ☐ MECH ☐ ALL

15) Building Plans Needed?: ☐ Yes ☐ No

16) Building Name:

17) Contact Person/Phone Number:

18) Levels above ground:

19) Levels below ground:

20) Number of Residential Units:

21) Number of Residential Units Non-Habitable:

22) Estimated Cost of Damage:

23) Comments:

Safety Damage Assessment Guidesheet (Cont'd)

1. *Area inspected (use Exterior)*
2. *Type of construction*
3. *Occupancy type*
4. *Historic (more than 50 yrs. old)?*
5. *Collapse, partial collapse, or building off foundation?*
6. *Building or story leaning?*

Safety Damage Assessment Guidesheet (Cont’d)

7. *Racking, damage to walls, or other structural damage?*
8. *Chimney, parapet, or other falling hazard?*
9. *Ground slope movement or cracking?*
10. *Other evaluation: Use for roofing damages (indicate “Roofing” and whether or not temporary Blue Roof was installed)*

Safety Damage Assessment Guidesheet (Cont’d)

11. Estimated damage: This is total building damage (excl. contents) – use 30-60% for all 1, 1.5, & 2-story homes flooded 2-7 feet
12. Barricades needed in the following areas: Annotate on form and placard
13. Cause of damage?
14. Are permits required? For 0’-1’ flooding use “Bldg/Mech”; For ≥ 2’ use “All”; none for minor roofing

Safety Damage Assessment Guidesheet (Cont'd)

15. Building plans needed? Yes if building is >2,500 s.f. or 2 stories and >50% damaged
16. Building name
17. Contact person/phone #: N/A
18. Levels above ground: # stories
19. Levels below ground: Usually none
20. Number of residential units

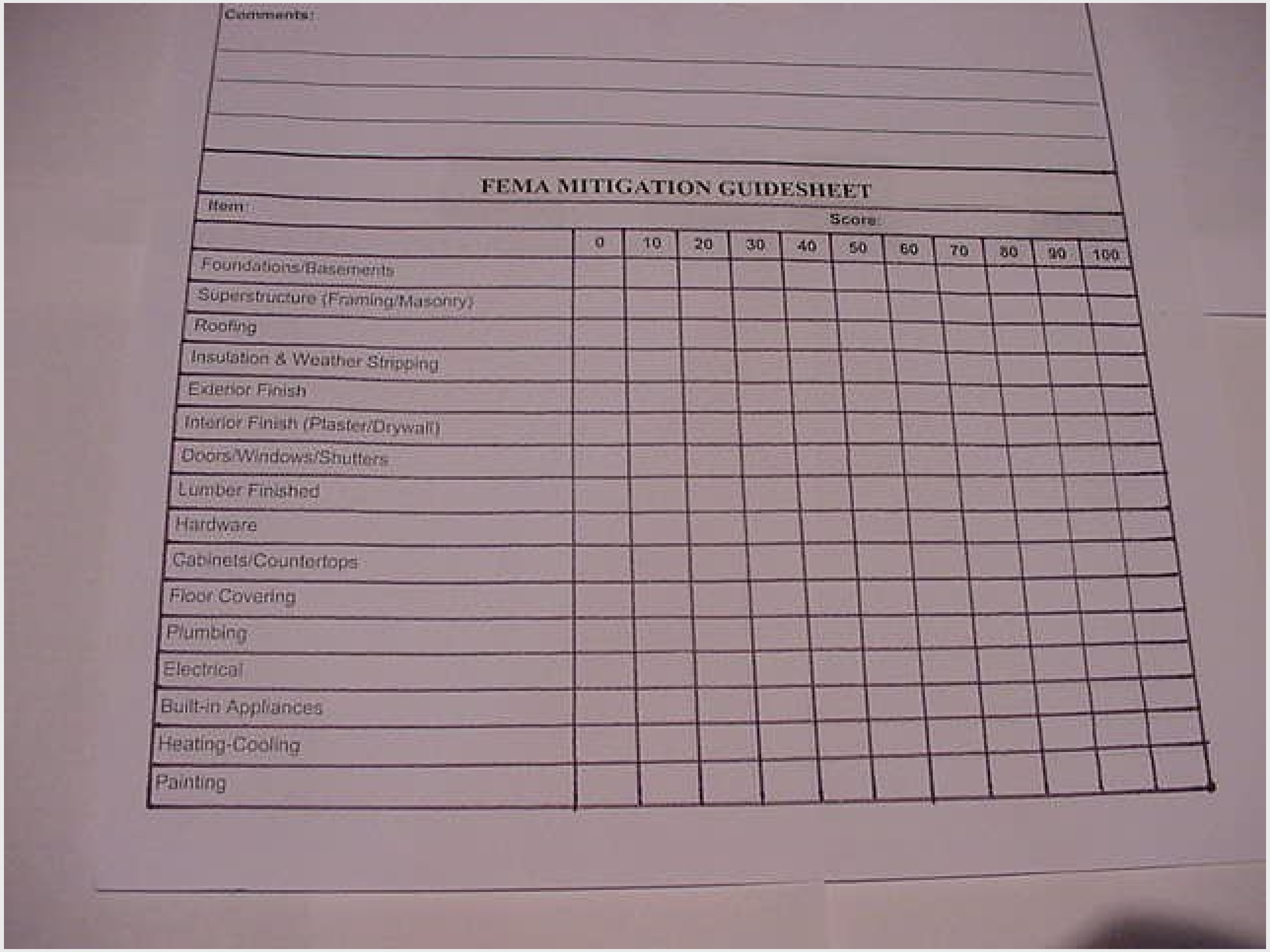
Safety Damage Assessment Guidesheet (Cont'd)

21. Number of residential units non-habitable

22. Estimated cost of damage: *N/A*

23. Comments: *Very important! Indicate on form reason why yellow or red placard posted (should match what is written on placard)*

FEMA Mitigation Guidesheet



Comments:

FEMA MITIGATION GUIDESHEET

Item:

Score:

	0	10	20	30	40	50	60	70	80	90	100
Foundations/Basements											
Superstructure (Framing/Masonry)											
Roofing											
Insulation & Weather Stripping											
Exterior Finish											
Interior Finish (Plaster/Drywall)											
Doors/Windows/Shutters											
Lumber Finished											
Hardware											
Cabinets/Countertops											
Floor Covering											
Plumbing											
Electrical											
Built-in Appliances											
Heating-Cooling											
Painting											

FEMA Mitigation Guidesheet (cont’d)

1. Foundations/Basements
2. Superstructure (Framing/Masonry)
3. Roofing
4. Insulation & Weather Stripping
5. Exterior Finish
6. Interior Finish (Plaster/Drywall)

FEMA Mitigation Guidesheet (cont'd)

7. Doors/Windows/Shutters

8. Lumber Finished (trim)

9. Hardware (door knobs and hinges)

10. Cabinets/Countertops

11. Floor Covering

12. Plumbing (includes hot water tank and fixtures)

13. Electrical

FEMA Mitigation Guidesheet (cont'd)

14. *Built-in Appliances*
15. *Heating & Cooling*
16. *Painting (interior)*

Rapid Evaluation Criteria

1a. The building has collapsed or significant partial collapse	UNSAFE
1b. A portion of the building has collapsed	RESTRICTED USE
1c. The building has moved off its foundation	UNSAFE

Rapid Evaluation Criteria – (cont'd)

2. Building or foundation is significantly out of plumb	*UNSAFE*
3. Severe damage to primary structural members	*UNSAFE, or RESTRICTED USE*
4. Serious falling hazard present	*UNSAFE, or RESTRICTED USE*

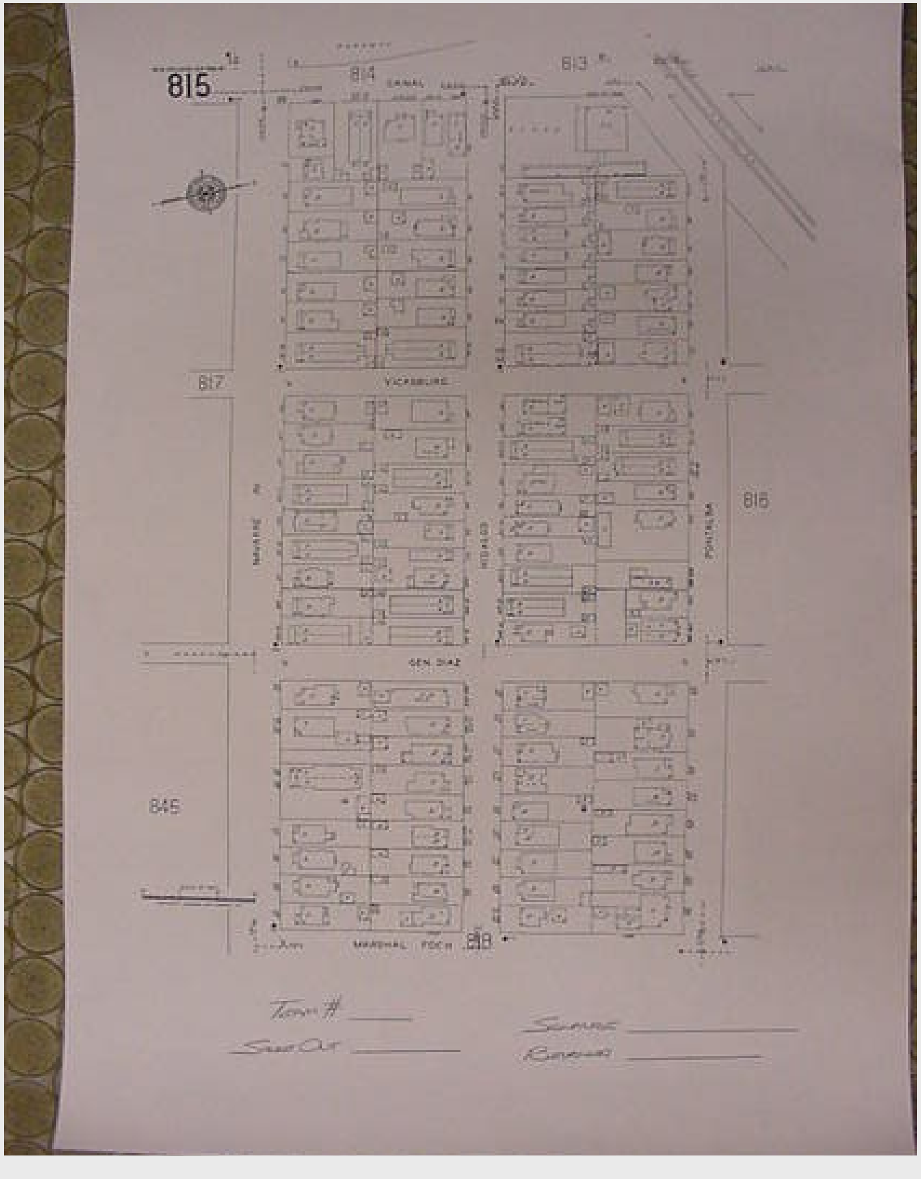
Rapid Evaluation Criteria – (cont’d)

5. Geotechnical hazard undermining foundation stability	*UNSAFE, or RESTRICTED USE*
6. Electrical lines,fixtures, or mechanical equipment submerged during flooding	*UNSAFE, or RESTRICTED USE*
7. Other noticeable life safety hazards	*UNSAFE*

Rapid Evaluation Criteria – (cont'd)

8. Large debris washed into, or coming to rest against structure, or foundation	*UNSAFE, or RESTRICTED USE*
9. Sedimentation inside or against building exterior (> 1 or 2 feet)	*UNSAFE, or RESTRICTED USE*
10. Unknown chemical spills	*UNSAFE*

Inspection maps


815
814
813
CANAL
817
VICKSBURG
816
GEN DIAZ
845
MARSHAL FOCH
818
Team #
Start Out

SSA Inspection Procedures

1. Observe roof damage from street

2. Examine the site for geotechnical and general debris hazards

3. If safe, walk around exterior of building, view all 4 sides – examine foundation and structural system; check for racking, bulging, or shifting of building superstructure

SSA Inspection Procedures – (Cont’d)

4. Measure flooded elevation above first floor level

5. View interior conditions of building through doors or windows; do not enter unless gutted and cleaned

6. Inspect for nonstructural hazards

SSA Inspection Procedures – (Cont’d)

7. Inspect for other hazards

8. Complete forms and post building (if red); notify Team Leader if you run out of red placards

9. Very Important! Make sure that correct disposition (green, yellow, or red) and flood water depth are indicated on the form

Submitting Inspection maps

- *Required information to be written on inspection maps assigned to teams:*
    - Team #
    - Date Sheet Assigned
    - Date Sheet Returned
    - Printed Name of Team Leader
    - Signature of Team Leader

SSA Inspection Procedures – (Cont'd)

- ***Evaluation Teams should not:***
  - Provide recommendations relating to possession retrieval
  - Provide escort for owners/ tenants
  - Retrieve possessions for owners/ tenants

6. Safety

Inspection Safety

- Be aware and cautious at all times
- Always work in teams of two individuals
- Always wear a hard hat when appropriate
- Steel-toed work boots required

Inspection Safety (cont’d)

- Be aware of stray animals and, hidden snakes, rodents, and insects
- Watch out for naily boards, broken glass, and other hazardous debris
- Building interiors contain substantial mold growth; do not enter buildings

Displaced Animals

Inspection Safety (cont’d)

- Be aware of aggravated or hostile residents
- Wash hands frequently; avoid eating and smoking if contact is made with contaminated materials
- No alcohol on job; no drugs period

Inspection Safety (cont’d)

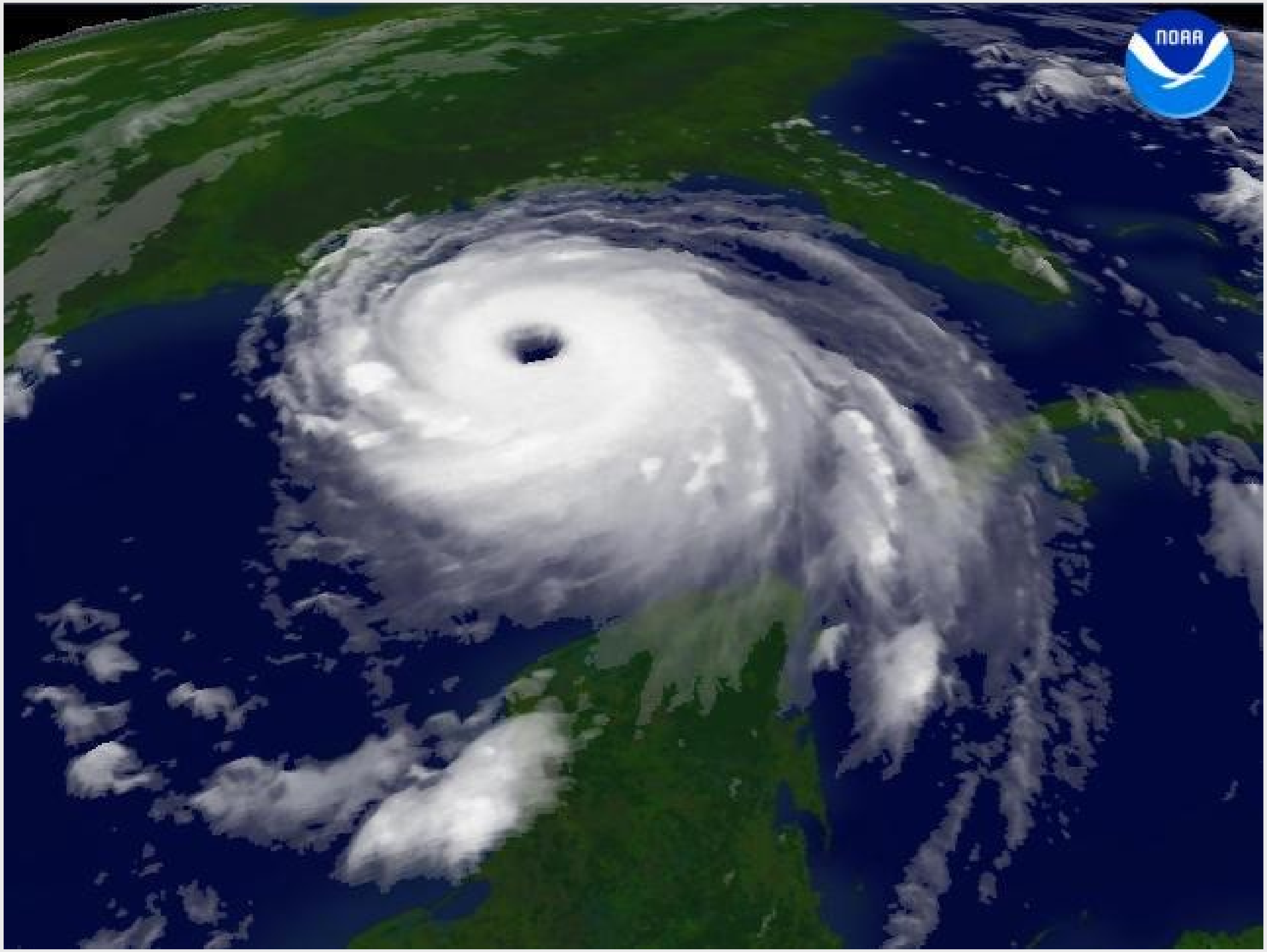
- Be aware of heat stress; drink plenty of water and take short breaks as needed

- Drive carefully and defensively; don’t get distracted looking for addresses

Inspection Safety (cont'd)

- Be aware of potentially dangerous chemicals in vicinity of building inspections; do not approach. Report any observed spills or questionable conditions to Team Leader.

THE END



Acknowledgement

This presentation was partially compiled using principles and guidelines adapted from Applied Technology Council (ATC) 45, "Field Manual: Safety Evaluation of Buildings After Wind-storms and Floods"

ANY QUESTIONS?